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ON A PECULIAR OUTBREAK OF OSTEO-POROSIS OR SOME OTHER "BONE DISEASE" IN CATTLE.

BY A. E. MACGILLIVRAY, BANFF, N.B.

As a rule, the diseases attacking the bones of cattle are, comparatively speaking, far from satisfactorily understood, their nature and course being open to considerable doubt, writers on the subject holding very conflicting opinions. It is therefore with great diffidence that I offer the following notes on what I consider a rather uncommon, if not unprecedented, occurrence of "Disease of the Bones" among the cows on a farm in this locality.

Within the past fifteen months no less than five young cows and a pregnant heifer have had to be slaughtered in consequence of the effects of this "Bone Disease," which, in so far as I can see, is the Osteo-porosis of Williams. With the exception of the heifer, the initiatory symptoms in all were the same—namely, a peculiar stiffness in progression, the least movement forward being accomplished with extreme caution, as if the animal's back were stationary and immovable, and the legs flexed as little as possible; great difficulty in rising; at times the shoulders turned out, and again the elbows in a like position; emaciation in three of the cases; no particularly prominent swellings in any of the joints. Three of the cows entirely lost the power of rising, and of these two were in good condition and one the reverse. I had all the five ultimately slaughtered.

The case of the pregnant heifer slightly differed from the others. Here the first symptom of anything being wrong was severe tenesmus, with a bloody discharge from the rectum. I explored *per vaginam*, but found nothing wrong, though on examination *per rectum* I discovered a swelling exactly below, in so far as I could judge, the junction of the lumbar vertebræ and sacrum. This abnormality, on pressure, seemed to fluctuate slightly, so I intro-

duced a covered knife *per rectum*, and opened it freely; very abominably smelling sanious pus escaped, and continued to do so for a week or so. The tenesmus now became much more severe, and ultimately the heifer aborted, which untoward circumstance I have no doubt resulted from the almost continual straining, caused by the irritation of the diseased part or parts in the roof of the pelvis, as the fœtus was alive. Some time after the abortion the discharge from the rectum and the tenesmus gradually came to a conclusion, but about two months after two abscesses appeared externally, one on each side, about the junction of the sacrum and coccyx, or rather, about the posterior third of the sacrum. These abscesses continued to discharge now and again, till the heifer went to the butcher in good fair condition.

Having given these details, I will now pass on to note the *post-mortem* appearances, which at first rather staggered me. Before I saw them personally I was told that the butcher could "cut up the backbone quite easily with his knife, as it was very soft." I felt inclined to pooh-pooh this rather remarkably unlikely story, but a personal inspection confirmed the report from the slaughter-house. On cutting into the bones I found them high-coloured, soft, and spongy, and on squeezing the cut surfaces or scraping them with a knife, a dark, pinkish, bloody fluid freely oozed out in all directions; in fact, there appeared to be a remarkable deficiency of solid material, and, instead, a preponderance of abnormally soft osseous tissue of a pinkish-red colour. The periosteum was similarly affected, but not so high in colour, and was easily peeled off. The vertebræ were the most seriously affected, but the diseased condition was easily perceived in the other bones.

As no traces of Tubercle were found in any of the patients, and from the *post-mortem* symptoms presented, I came to the conclusion that I had to deal with the Osteo-porosis of Williams. Be this as it may, however, the extreme rarity of such a peculiar outbreak of a but partially understood disease rendered its being made public almost a necessity.

A USEFUL HORSE BOX.

BY GERALD H. FENTON, M.R.C.V.S., A.V.D., INDIA.

In conversing with a friend on this subject the other day, he (Col. Hindle, of the Madras Army) showed me an invention of his, which apparently has been lying dormant for some years.

After studying the advantages that this box undoubtedly possesses, I am induced, by the Colonel's kind permission, to send the plan and description to the Veterinary Journal, as I feel sure a number of its readers will feel interested in the subject, and possibly might improve on some of the details.

The mode of feeding is not mentioned, but a blanket rigged up for the hay and a nose-bag for the corn would meet this requirement.

I should much like to see this horse box come into general use, for the reasons stated in the explanation.

Explanation and description of the many and various advantages of the horse box :—

A. Bottom of box.
B B. Two sides.
C C. Two ends.
D. Moveable hood, waterproof canvas.
E E. Curtains at both ends.
1 1. Dees to which a strap is attached, passing over the hind quarters of the horse like a kicking-strap.
2 2. The same to which hobbles, round fetlocks are attached.
3 3. Do. to which strap is fastened that passes over the withers of the horse to prevent him rearing.
4 4. The same to which hobbles are attached.
5 5. Dees to which a breeching strap is fastened.
6 6. Dees to which a broad breast strap is fastened.

The two sides and two ends have hinges with pins that can be withdrawn, and so permit of A, 2 B's, and 2 C's being separated, and made convenient for storage in coach-house, or warehouse, or railway station.

The moveable hood can be taken off by the screws (which are like compass screws), being unscrewed slightly, when the hoods can be placed on ends one within the other in the coach-house.

The curtains can be rolled up or let down at will, and are like inverted aprons of a gig ; in the lower portion of the curtain is a thin iron rod with a loop at each end, into which two rods attached to the sides of the box fit, so as to allow a current of air to pass into the box from the bottom.

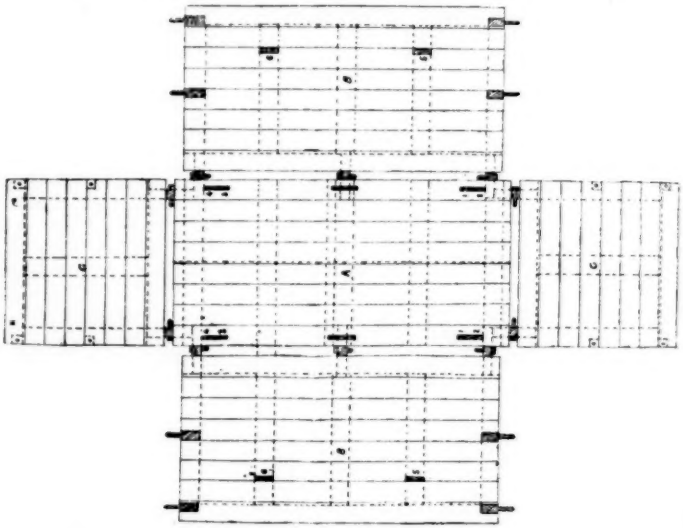
In order to put the horse in the box, the sides and two ends are unpinned and laid flat on the ground, in the same plane as the bottom of the box ; the horse is then led on to the box ; the hobbles, kicking-strap, and wither-strap, breeching and breast plate are then fastened, the sides and ends lifted up, and pinned like the tail-board of an ordinary cart, and the hood is screwed down ; the horse cannot by any possible means injure himself. If necessary he can be hoisted under a pair of sheers with a broad belt or sling under his stomach, and then gently lowered into the position he adopts when lying down, and the kicking and wither straps are fastened ; he cannot rise. Had this plan been adopted, " Bluegown " could not have kicked himself to death.

The box has four small wheels about the size of a railway porter's barrow wheel, and can be moved along the platform and run on to a flat truck, which should be brought as nearly as

possible with its surface level with the platform; if there is a slight incline, a couple of planks placed at the distance of the wheels of the box apart will do—even any ordinary ballast truck would hold three of these horse boxes. The boxes can then be lashed to the truck.

The advantages of this box are—

1st. Every trainer or owner can have any number of boxes of his own ready at hand; if distant from the railway station, they can be taken to pieces and carted to the station.



PLAN OF HORSE BOX.

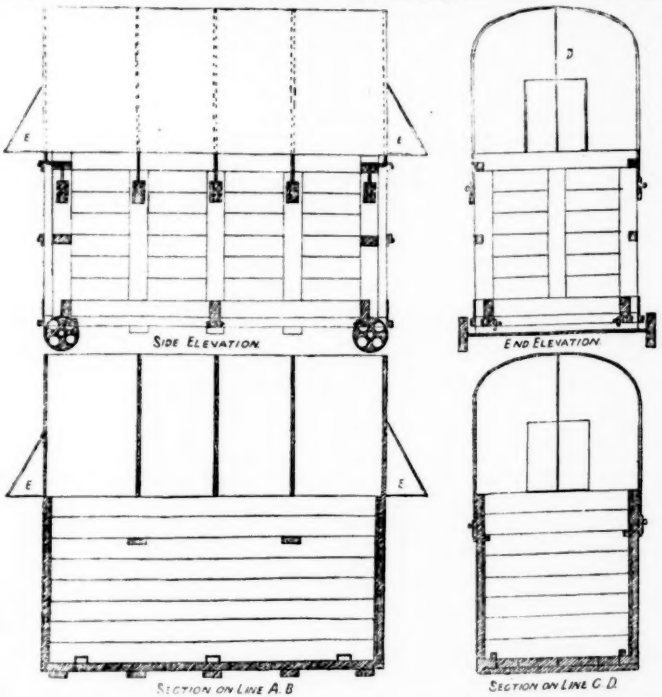
2nd. He knows they are clean, and that no animal infected in any way has been in them before.

3rd. They can be stored at the smallest of stations, and be ready for use for hunting men or gentlemen taking their studs to town at a moment's notice.

4th. They would be a saving both to the railway company and to those who wish to send their horses by rail, instead of having the cumbrous horse-boxes at present in use, and trucks are always procurable.

5th. They would be especially useful in embarking or disembarking horses that have to be sent anywhere by sea, for they could be slung up from the yard-arm, and the horse would have a box on deck.

In case of fire on a railway truck, the ends and sides can be immediately let down and the straps loosened, when the horse could jump off, and so not run the risk of being burned to death, as "Klarikoff" in "Kettledrum's" year, 1861. The box obtained honourable mention at the Madras Soldiers' Exhibition of 1869. It was then designed solely for the safe landing of Government horses imported from Australia, but the Government would not adopt it, as they said they only purchased horses that



had been safely landed. No heed was taken of the sufferings the poor animals underwent on landing through the Madras surf; twenty per cent. of the horses so landed are badly injured—some irretrievably so. The boxes can be made of light strong wood, as the horse cannot possibly injure them or himself. They could also be used for prize stock, if made on a larger scale, and thus prevent the fat beasts having to walk any great distance, and so throw out Spavins, etc.

A CASE OF KYLOSSIS OF THE LIMBS TREATED BY TENOTOMY.

BY FITZGERALD EASSIE, M.R.C.V.S., YORK.

A WELL-NOURISHED carting colt was found to have acquired a contraction of the flexor tendons of the limbs, a few days antecedent to a local show for which he was entered with his dam. The idea of exhibiting him was abandoned, and he was turned out. He was then about five months old. At the age of nine months, when treatment was resolved upon by the owner, the contractions were of so decided a nature that he was completely crippled. At this period the fore limbs in profile presented a perfectly straight outline, the anterior surface of the hoof running with the pastern perpendicularly to the fetlock. The hoofs were altogether misshapen, the toes being rounded and obtuse, the soles looking backwards and the heels placed high in the air. The hind legs were similarly affected, though not to the same extent.

The flexor tendons of the off fore leg were firstly divided, with antiseptic precautions, by the operation of subcutaneous tenotomy; and after all adhesions had been broken away by forcible extension, the limb was enveloped from the knee to the coronet in a clean woollen roller, and finally encased in a thick envelope of plaster of Paris bandages. At the end of a week, a shoe with a projecting toe-piece (two inches) was applied to prevent recontraction, and the animal was turned into a loose box. The tendons of the other fore leg were subsequently severed in the same manner, the wound healing by primary adhesion. In this instance the limb was forcibly extended as before, but the plaster bandages were dispensed with and no shoe was applied. Previous experience led me to contrast the results of this variation in method, the sequel being, as I anticipated, that the *left* leg—in which the application of the plaster cast and the shoe were omitted—made a more satisfactory recovery than the *right*, on which these precautions had been adopted. The plaster seems to retard the process of complete recovery, by preventing the slight movement necessary to the differentiation in growth of the *perforans* and the *perforatus* tendons. The application of the *spur-shaped* shoe—in this particular instance at least—was not a success; for whereas in the left leg, for which it was *not* used, there proved to be no necessity for its application, in the right, for which it *was* employed, it produced, for a month at least, a condition alarmingly opposite to the original lesion.

About six months have now elapsed since the first set of tendons were divided, and the animal appears to have perfect control over

both his fore limbs. The left is quite normal to the touch, and as regards outline. The right (on which the shoe and plaster were used) is symmetrical as to the position of bone and ligament, but thickened at the seat of the operation.

Tenotomy was not resorted to in the hind limbs, the feet being simply pared as nearly as possible to their natural shape, and a "*tip*" applied to each—the iron at the toe very thick, rapidly decreasing in depth posteriorly. The contracted flexors, with the *continued* traction exerted upon them by this improvised leverage (absolutely uninterrupted since the thickened shoes were applied to *both* feet), gradually lengthened, the *frogs* ultimately assuming their natural position upon the ground. The contracted heels also, with the latitude allowed by the *tips*, gradually expanded, the front ones following suit, until, all influences combining, the animal was restored to a state of usefulness, in marked contrast with its original deformity.

Such is the history of a case, common enough in the practice of our profession, and of interest only insomuch as it involves a question of causation not dependent upon congenital conditions, with which Kylossis in young stock is generally associated.

This particular animal was born with well-formed limbs, lived the earlier portion of its life with perfect control of them, and at the age of five months became the subject of contracted tendons. We may advance theories of Paralysis, of Spasm, of hyper-development, and of antagonistic muscle, but the causes which determine these accidents of growth in an apparently healthy animal are still remote in the chaos of nervous complexities which govern the processes of assimilation.

Again, the surgical means employed—the rapid reduction of the deformity—as practised so successfully by the profession, is an argument in comparative pathology well worthy of consideration in the question of the relative advantages of *mediate and immediate* reduction in the treatment of talipes and allied distortions.

FRACTURE OF THE SESAMOIDS OF ALL FOUR LIMBS.

BY C. RUTHERFORD, F.R.C.V.S., ASSISTANT PROFESSOR, ARMY VETERINARY SCHOOL, ALDERSHOT.

THE following case may be of interest to some readers of the VETERINARY JOURNAL. A spirited, fast, well-bred polo pony, which belonged to Capt. G——, whilst being taken out to exercise at Pinetown, Natal, in February, 1886, suddenly shied, it was said, and commenced to canter for a few yards from that officer's door. The native boy riding it, dismounted on finding the

animal going very stiffly. When seen by me half an hour afterwards, the pony was lying close to the spot where the boy had dismounted, and on manipulation one could feel most distinctly that the sesamoids were broken.

A *post-mortem* examination within an hour afterwards showed extensive extravasation of blood around all four fetlocks; transverse fracture of both sesamoids of both fore and of the near hind close to their lower edge, and also of that of the outer sesamoid of the off hind close to the upper edge of the bone. The left sesamoid of the off hind was fractured in three places—split without displacement of the pieces.

The anterior surface of the sesamoids of the off fore and near hind limbs were almost denuded of cartilage, and of a bluish colour.

The lateral ligaments of all four fetlocks, and the branches of the superior suspensory ligaments of both fore, were lacerated, torn, and bathed in extravasated blood.

There was abrasion of the cartilage of the upper extremity of the suffraginis of the off hind, and of the inferior extremities of both metacarpi and both metatarsi, most probably from contact with the edges of the fractures mentioned above.

This pony had been played at polo at least twice a week since purchase in Natal about three months previously, and had not been lame during that period, so far as the owner was aware. Is it not unusual to meet with a case of such extensive injury to the sesamoids of all four fetlocks, occurring whilst doing ordinary exercise, and when apparently in good health? There must of course, we presume, have been some malnutrition or disease of these bones, though not apparent to the naked eye.

TWO REMARKABLE CASES.

BY DANIEL D. LEE, M.D.V., INSTRUCTOR IN ANATOMY AND OPERATIVE VETERINARY SURGERY, HARVARD UNIVERSITY, U.S.A.

CASE I.—*Pin in the Tongue of a Cow.*

EARLY one morning I was called to see a cow which had not eaten for the past five days.

I found the animal naturally much emaciated and in pain, with the head and neck kept extended. Rumination was entirely lost; the breath was very offensive.

On putting my hand into the mouth, I was able to remove a mass of decayed food, blood, and mucus from the throat. I found nothing in the anterior part of the mouth. I expected a history

of choking, but was unable to get any, the only history being that the cow had suddenly refused to eat.

I said I thought the animal had partial paralysis of the throat, for when bottled she was still able to swallow in a jerky manner.

I, however, decided to pass the probang before deciding positively.

Later in the day I returned with a speculum oris and probang. On introducing the speculum the cow showed great pain, and threw herself down. I continued the examination, and, having my right hand under the tongue and the bar of the speculum over it, I felt a small sharp body coming through the under surface of the tongue, which I seized and drew out. It proved to be a piece of an ordinary toilet pin, about half an inch long, with the head broken off.

There was no swelling of the tongue to lead me to suppose that any foreign body was embedded in it, nor was there any discharge. The pressure of the bar of the speculum on the dorsum of the tongue and my fingers underneath, had forced the pin out.

Recovery was rapid; the cow at once began to eat ravenously.

I attribute the fact that the throat seemed to be the seat of the trouble, to some nerve in the free portion of the tongue being transfixed by the pin, and this causing so much pain that the animal was unwilling to raise the tip of the tongue, this act we all know, being the first motion in the mechanism of deglutition.

Case II.—*Paraphymosis in a Dog.*

Somewhat over a year ago, I was called to see a spaniel dog which was troubled with Paraphymosis.

After giving my diagnosis and prognosis, I was told that my services would not be required, as a homœopathic practitioner was treating the case.

Last week I was again summoned, and found the dog nearly dead. He had been vomiting constantly for five days, often throwing up blood.

The old trouble with the penis was still present, having never been entirely cured.

On examining the penis I found the os penis entirely denuded of soft tissue for an inch and a half from the end, and in a state of caries. The soft parts were much ulcerated, and when lapped by the dog bled profusely. The poor animal was so weak from loss of blood and vomiting, that I gave a very unfavourable prognosis, and advised, as his only chance, that I should at once amputate the diseased penis, as septicæmia had evidently set in.

I ordered small and repeated doses of brandy and water and of

milk and lime water, and returned in a few hours with an assistant to operate. I removed the penis just anterior to the erectile bulb, slitting up the sheath. Hæmorrhage was slight and entirely controlled by hot water. I slit the urethra, secured it by sutures, and drew the soft parts over the bone, which I cut off well behind the bulb.

I should have removed the entire penis, leaving an opening for the urethra just under the anus, as I have successfully performed this operation on the dog, but feared the great hæmorrhage likely to result, and to withstand which the dog was not strong enough.

The animal did well after the operation, passed urine twice, and did not bleed, but died of shock in the evening.

On questioning the owner, I found that twice during the year the os penis had become denuded of soft tissue for half an inch, and had decayed and broken off, the end of the penis again becoming healthy until another attack of Paraphymosis, when it again became diseased.

The vomiting of blood I finally traced to the dog having licked and gnawed his penis, swallowing the blood and then vomiting it.

The homœopath had been treating him with large doses of bismuth for hæmorrhage from the stomach. This case is one that could certainly have been saved if treated in time.

In cases of this sort I recommend amputation of the penis at the ischial arch. The castration of the dog first makes the operation easier, but is not necessary.

The skin of the sheath is to be first divided by a longitudinal cut with the scissors, beginning at the opening of the prepuce and extending backwards. The penis is then dissected out, and a catheter passed into the urethra. An incision is now made down into the urethra (being guided by the catheter) in the perineal region, under the anus.

The mucous membrane of the urethra is drawn out, and secured on each side to the skin by sutures.

After this, an écraseur is adjusted to the penis, which is then removed.

It is necessary to remove a triangular piece of skin on each side of the median line, including, in the base of the triangle, the skin and mucous membrane of the sheath, and running the point up to the under surface of the pelvis.

The edges of the wound should then be sutured together; they will rapidly heal, the parts being so vascular. If the skin is not removed, a pendulous fold will remain, and the mucous membrane of the prepuce will continue to secrete, making the parts foul.

DIAPHRAGMATIC HERNIA.

BY KAY LEES, F.R.C.V.S., ARMY VETERINARY DEPARTMENT, NEWBRIDGE, IRELAND.

THE case in question occurred in a waler (Australian) gelding, a riding wheeler in one of the batteries under my charge during the Durbar held at Rawal Pindi, India, for His Highness the Ameer of Afghanistan.

The battery had gone out for drill at 10 a.m. on the Khana plain, which, owing to the severe rain, had become very deep in mud. On returning at 11.30 a.m., the horse, which was a very free worker, threw himself down on being taken out of harness, and the man who was riding him stated that he had not observed anything previously amiss with him. He presented at first the ordinary symptoms of spasmodic Colic, and the usual treatment was adopted. The peculiarity noticed was that, after about an hour, the abdomen presented a tucked-up appearance, great difficulty in breathing was experienced, a loud and peculiar gurgling sound was heard over the right thoracic region, nostrils dilated to a very great extent, and the countenance had a haggard expression—much more so than is usually observed in abdominal diseases—pupils dilated, semi-comatose condition, continuous and persistent abdominal pains, injected visible mucous membranes; cold sweats bedewed the body, and the muscles generally were in a tremulous condition. The patient persisted in standing, with the fore legs apart, and, at intervals, straining violently. The most noticeable features in the case were the manner in which all the symptoms increased spasmodically with intervals of paroxysms, the abdomen appearing to empty itself of its contents, and the gurgling in the chest, with difficulty in breathing, increasing in corresponding ratio until the animal finally died at 8 p.m. the same day.

A *post-mortem* was made the same evening. On opening the abdomen, the most noticeable feature was its comparative emptiness. A rupture about four inches long was found on the right side of the diaphragm at its inferior part and situated in the muscular portion; round it, on both the thoracic and abdominal surfaces, was a quantity of extravasated blood, staining the muscular tissue; the whole of the small intestines, from the pyloric orifice of the stomach to the illio-cœcal valve, were found to have passed through the rupture into the cavity of the thorax, displacing the right lung to the left side of the thorax and under the apex of the heart. Round the small intestines, at intervals of about three feet, there were gangrenous rings, which gradually softened into lighter colours of inflammation and congestion, evidently caused by the small intestines becoming constricted in the rupture and then being released by the animal straining, and passed into the thorax,

when a fresh portion became imprisoned, to be relieved in turn. All the other internal organs were more or less healthy.

As the case appears to be an uncommon one, and the symptoms so diagnostic, it may perhaps be of some interest to the readers of the VETERINARY JOURNAL.

TWO RARE CASES.

BY P. BEATTIE, M.R.C.V.S., BOGFERN, TURRIFF.

I.—RUPTURE OF THE RECTUM IN A FIVE-YEAR-OLD HORSE.

SOME time ago I was asked to castrate a five-year-old cart-horse. Every precaution was taken to have the animal duly prepared for the operation. When lying the animal did not struggle much, but strained rather badly. When the operation was finished, I noticed the rectum protruding to the extent of about a foot. All attempts to return the bowel when the horse was lying only made the condition of affairs worse. There was no difficulty in putting matters right whenever the horse was on his feet.

In about half an hour after the operation signs of slight colicy pains were noticed. A dose of linseed oil, with anti-spasmodics, was given, the latter repeated. The pain rather increased than diminished. From the time the animal was operated on no fæces were passed.

The rectum was examined twice a-day, but nothing was found amiss until the fourth day, when I noticed blood on my hand. I then discovered a transverse rent in the bowel, quite sufficient to allow my hand to pass through. Death from Peritonitis took place on the fifth day.

II.—INVERSION OF THE BLADDER IN A CART-MARE.

In June last my attention was called to an aged cart-mare, thirty hours after foaling. The owner, seeing the mare straining heavily and making no progress in foaling, being in weak health himself, sent for a neighbouring farmer. This person had no sooner begun to find what was amiss than he complained of a bag in the passage he could not understand. The foal was soon extracted; the after-birth almost immediately followed, but the bag remained. The owner reported to me that he thought the mare was not micturating properly, that she also had colicy pains. On examination I found the bag complained of, and from the absence of the meatus and the squirting of urine from the ureters I concluded that the bladder was inverted.

I tried to return the viscus, but failed. Before taking any active steps, I asked my friend Mr. Tait, veterinary surgeon, Turriff, to examine the mare. He confirmed my diagnosis, and it was agreed

to allow the mare three days to pick up, as the colicy pains had disappeared and her appetite was much improved. At a subsequent visit the bladder was removed, partly by the écraseur and partly by ligature. The patient never showed a bad symptom, and is now thriving well and rearing a fine strong foal.

FIBROUS LIPOMA IN THE HORSE.

BY J. A. NUNN, F.R.C.V.S., ARMY VETERINARY DEPARTMENT, NATAL.

THE animal from which the tumour was taken died of South African Horse Sickness in April, 1887. The tumour, which weighed about four ounces, was the size of a hen's egg, and was encapsuled in the peritoneal coat of the colon. On section it showed all the usual appearances of a fibrous lipoma, being divided by numerous strong fibrous tuberculæ into sections, which contained the gigantic fat cells commonly found. Lipomata are usually found in connection with existing adipose tissue, although cases are mentioned of their having been found in the human being in parts that do not in health contain fat—such as the sub-mucous tissue of the intestine, dura-mater, heart, liver, bone, muscle, etc. As this tumour was altogether in connection with a serous membrane, and I can find no mention of a similar case in the horse in the few professional works I have access to in this country, I thought perhaps it might be of interest to some of the readers of the VETERINARY JOURNAL.

TRACHEOTOMY IN VIOLENT STRAINING IN THE COW AFTER PARTURITION.

BY J. K. CALDERWOOD, M.R.C.V.S., CLITHEROE.

I SEND a note of the following case, not that it offers any special clinical appearances, but on account of the line of treatment adopted with most satisfactory results. The subject was a Shorthorn heifer, at first time of calving. From what I could learn, she calved naturally, but immediately after commenced straining most violently, and certainly when I saw her there was great danger of Prolapsus Uteri. A truss had been applied, but after cleansing her and carefully examining the womb, I stitched the vulva (as in violent straining, in my opinion, trusses are useless), and gave sedative medicine. The hind quarters were raised, and linseed oil, with solution of opium, injected into the womb.

Next day no better. When the finger is put into the vulva the Os is plainly felt every time she strains. She will get down on her broadside and strain so violently that urine and fæces are

ejected with force, and the rectum is partially everted. Treatment continued for four days with no good result, and as the owner expected her doing no good, I determined (having read Professor Williams' excellent paper in the Journal), as a last resource, to perform tracheotomy, with the result that the straining was greatly, but not wholly, diminished. As Professor Williams pointed out, the abdominal muscles came into play. Next day, feeding fairly well, with occasional straining, but she progressed so rapidly that the tube was removed on the fourth day, when the straining had completely stopped. She has now done well, and is at the present time in good condition.

I attribute this rapid recovery to the operation of tracheotomy diminishing the straining, and thus affording the rest the irritated womb required, and I shall certainly in future resort to this operation earlier in such cases.

THE GEOGRAPHICAL DISTRIBUTION OF BARSATI.

BY R. W. BURKE, A.V.D., JUBBULPORE, INDIA.

THE geographical distribution of Barsáti gives perhaps the best indications of its pathology. These indications have rather increased since the important researches of Sir James Paget, Mr. Havilande and others, on the distribution of Cancer in England. It is conclusively shown, that in human beings Cancer does not prevail to any extent, if at all, in certain rocky districts which afford much limestone, and suggests preventive means in other districts where it is more prevalent. Dr. Henry Butlin has already shown that "High and dry localities are unfavourable to the occurrence of Cancer, and that the disease flourishes chiefly in low, flat parts of the country (England), which are covered by alluvium and watered by many streams that are subject to frequent floods." (*British Medical Journal*, July 11, 1885.)

A fact connected with this difference of distribution is that which I pointed out some years ago, viz., that the prevalence of Barsáti was associated with the principal river systems in India. In examining the distribution of Barsáti in India, we found that the highest percentage of admissions from this cause was noted in the Bengal studs, which were situated on the banks of the principal river system in the country. The government stud at Hájipur, near Patna, was abolished many years ago, in consequence of this very prevalence of Barsáti among the horses. Since my return to India recently, I had shown the presence of Barsáti to be greatest in stations situated on the banks of the river Ganges, and that in hilly districts which were located some distance away from the principal river-beds, there was to be found an exceptional

decrease in cases of this disease. Take, for example, Jubbulpore and Saugor districts. Here there is an entire absence of Barsáti, noted in animals often previously affected in other stations, as shown by the Veterinary History Sheets. Not only in this district but in others further down the valley of the Nabadá, the Bijáwar rocks afford limestones of various qualities, among which the famous "Marble rocks" are particularly noteworthy, both for the beauty and purity of the material of which they are composed.

The Saugor rocks, which contain a great proportion of limestone, are also seen to be free from Barsáti. Since my first arrival in this station, more than two years ago, I have not known a single case of Barsáti, either in Government or private animals.

In Raipore district, in the Central Provinces, where limestone is so abundant throughout that it would be difficult to say where it is not found, I am told by many old residents, that Barsáti is practically unknown, and Veterinary Surgeon Hazelton writes to say (Q.J.V.S., April, 1888), that Barsáti is also "practically unknown at St. Thomas' Mount," in Madras.

Spontaneous resolution of Barsáti sore sometimes takes place on arrival at a rocky station, and I have recently had examples of this in battery horses at Saugor, as shown by the Veterinary History Sheets; and I attributed the cure to change of station, where the animals showed rapid recovery under simple treatment. In one case the disease had occurred several times when the animal was in another station, which rapidly recovered on arrival at Saugor, and has never since appeared. Principal Veterinary Surgeon Oliphant has drawn special attention to the fact* that taking horses, subjects of Barsáti, to the hills, brings about a speedy improvement.

I have recommended several horses suffering from this disease to be taken to the hills (Simla, Mussoorie, and Naini Tall), with marked benefit to the animals.

It will thus be seen that the disease prevails chiefly in low-lying, damp localities, and that in rocky stations it has been witnessed only as an exception, at long intervals.

The rocky nature of the soil here doubtless assists in reducing the number of admissions from this disease, but whether by its physical or by its chemical characters, it is difficult to say. "The silurian and other rocks that assist in reducing the prevalence of Cancer," says Dr. Haviland,† "do so more by their physical than their chemical characters." While Dr. William Stanwell (*Lancet*, April 21, 1888) advocates the treatment of Cancer by lime-salts, notably, burned oyster shells, and says that Cancer mortality is less in limestone districts in England.

* Pamphlet on Barsáti, by R. W. Burke, 1886. † *Lancet*, Mar. 10, 1888.

Barsáti flourishes in the low-lying parts of India where heat and moisture are combined. It is seldom or never heard of on the hills, or in dry elevated localities. And the Collective Investigation Committee in England, who were recently engaged in an inquiry into the prevalence of human Cancer, bring evidence to show that that disease prevails under similar conditions.

Dr. Lyford,* of America, writing on Barsáti, says, "It seems to be confined to the neighbourhood of Minneapolis and St. Paul, with the exception of a few cases which migrate each year." Minnesota, with its chief towns, St. Paul and Minneapolis, offer a climatic type precisely similar to that of India in the rains. The chief drawback to the above-mentioned districts, is the trying and unhealthy period which accompanies the annual melting of the snow.

Geographical distribution has never yet been studied in relation to Barsáti, so far as I am aware; but this undue prevalence of that disease in some stations, and almost entire absence in others, require further investigation. The remarkable difference in the prevalence of Barsáti in dry and wet seasons, which I pointed out some years ago, is sufficient to warrant us in believing that there is something underlying in the causation of this disease which has yet to be revealed. Another fact connected with this difference in relation to locality, soil, etc., is that which I first pointed out in 1880, to the readers of the VETERINARY JOURNAL, namely, that in my inquiries into the characters of Barsáti I had noted, that those who would best understand those local conditions which are coincident with an increase of this disease should study well the distribution of human Cancer. "There is abundant evidence to show that Cancer does not thrive in high, dry localities, where the soil is kept sweet by the absence of floods, and the nature of the rocks which either underlie it or form its principal constituents; and that it does thrive and become very fatal where floods prevail, where their emanations are sheltered, where vegetation is killed and decomposed, and where, after the floods have passed away, a rank herbage springs up, composed of sour grass and bitter plants" (*Lancet*, March 10, 1888), as during the rains in India.

VOMITION IN THE HORSE, IN SYMPATHY WITH A LESION OF THE RECTUM.

BY J. B. WOLSTENHOLME, M.R.C.V.S., MANCHESTER.

THE infrequency of vomition in the horse, and the fact that it rarely occurs in connection with any lesion of the alimentary tract below the stomach, gives an importance to, and creates an interest in the act, which otherwise would call for no special mention.

* VETERINARY JOURNAL, May, 1886.

One of the most constant symptoms of intestinal obstruction in the human subject is that of vomition. I have seen this in three or four instances in the horse, consequent upon obstruction of the small intestine at a point not exceeding twenty-four inches from the pylorus, but have never observed the same when the obstruction has occurred lower down.

The occurrence of vomition under the following conditions was to me unique. On July 2nd, at about 5 p.m., I attended a cart gelding manifesting signs of acute abdominal pain. He had passed a little fæces covered with blood.

I removed from the rectum a further quantity of fæces similarly covered, and several clots; then a calculus could be distinctly felt; it was firmly grasped by the bowel, and at the extreme distance of one's reach.

It was removed with the utmost care and patience, but the amount of blood present was a sufficient indication as to the nature of the case, and to warrant an unfavourable prognosis. The subsequent symptoms were treated with gum opii in balls, morphia and atropine hypodermically, hot rugs, etc. The horse drank several times during the night.

At about seven o'clock on the following morning, in the presence of the horsekeeper, he distinctly vomited, covering a wall and window sill with the fluid thus returned. The horse was in a standing position at the time, and died in about an hour afterwards. I called in the course of the morning, and saw for myself the evidence upon the wall and window as above described.

On *post-mortem* examination, a small perforation of the rectum was discovered, with inflammatory surroundings. A calculus of the rapidly formed "clinker" variety, weighing 4 lbs. 2 ozs., was found in the colon, but apparently without having caused any pathological change. The stomach contained about a gallon of fluid. The calculus from the rectum was somewhat cuboidal in shape; the angles were well defined and roughened—one of them particularly so; it measured $4 \times 3 \times 2\frac{1}{2}$ inches, and weighed 6 ounces.

Editorial.

MEDICAL MEETINGS AND CONGRESSES.

This year has been more than usually prolific in interesting gatherings of medical men, among whom, of course, we include veterinary surgeons, and the results should have an important influence on the progress of medicine, and especially on what has been designated State or Public medicine. A notable feature in these meetings, has been the larger amount of attention paid to matters which largely concern the veterinary profession, and the fact that one congress, originated by its members, was composed of some of the most distinguished medical and veterinary authorities in Europe, whose deliberations extended over nearly a week, and were limited to only one subject, but that one of the most serious, perhaps, which has ever been discussed by either branch of medicine—viz., Tuberculosis.

The meeting of the National Veterinary Association at Newcastle-on-Tyne had one-fourth of its time occupied in discussing the communicability of some animal diseases to mankind; while at that of the British Medical Association held at Glasgow, in the Section of Public Health the same subject was discussed by medical men and veterinary surgeons, and in a manner worthy of its importance.

The most noteworthy of these meetings, however, so far as the public are concerned, was undoubtedly that held at Paris for the purpose of considering Tuberculosis from a medical and sanitary point of view. The discussions were of a most interesting character, and the conclusions arrived at were of the highest moment with regard to the public health. It is satisfactory to find that this disease has at last received the attention its seriousness so well deserved, and that the veterinary profession, which has made the subject more especially one of its own, should now be so strongly supported by medical men in calling for legislative interference for its control, so that the public health and wealth may not longer suffer from its widespread ravages. For now many years we have persisted upon the recognition of Tuberculosis as a scourge to animals and a source of peril to human beings, and for a long time we stood alone in this country in insisting upon the great danger the community incurred through consuming the flesh and other products of tuberculous animals; and we are therefore all the more gratified that not only does the medical world discern the danger, but that legislators are at last bestirring themselves to do their duty, and aid us in stamping out a most formidable plague.

These meetings of the members of the two branches of medicine also augur well for the future progress of comparative pathology. We have long complained of its neglect, especially in this country, and have dwelt strongly on the loss this neglect has inflicted on human and animal medicine. Now a brighter day is dawning, and the twin sisters of the healing art will assuredly both reap the advantage of recognising their relationship, and combining to promote the more rapid development of their sacred calling.

HORSE-SICKNESS IN SOUTH AFRICA.

In the Journal for January (p. 38), we published an interim report on the above disease, from Veterinary Surgeon J. A. Nunn, Army Veterinary Department, who was sent specially to study it. The following is his final report, which, like the other, possesses much interest.

To the Principal Veterinary Surgeon to the Forces.

Pietermaritzburg, Natal, 13th June, 1888.

Sir,—In continuation of my former report on South African Horse-sickness, dated September, 1887, I have the honour to forward, for your information, the following additional notes and remarks on that disease.

These remarks are founded on information I obtained during my tour through the Cape Colony and Basutoland in the summer of 1887-88, and the further experiments I made in Pietermaritzburg during the past autumn; and although I regret to say that they are not of a very practical nature, and merely confirm my previous opinion that Horse-sickness is not Anthrax and is not communicable from one animal to another, they may, perhaps, be of some interest, especially as I believe I have traced a further development of a hitherto undescribed micro-organism. The total number of cases in Natal amongst the Government animals during the past unhealthy season, is shown in the return marked "Appendix A," in which is also given the places where animals were attacked.

The first case occurred in Natal on 13th February, at Durban, and the last on 1st June, at Ekoujeui, in Zululand. The first case in Pietermaritzburg occurred on 20th February, and the last on 29th April. The number of cases and mortality in the different corps is also given in the table, by which it will be seen that the greatest loss was with the transport mules in Zululand and on the Coast-road in Natal; but Veterinary Surgeon Raymond, A.V.D., informs me that all these cases that came under his personal observation had been down on the low-lying malarious districts on the coast, and in the river valleys a short time previously. The number of cases, 69, compared with those of last year, viz., 240, is small, and is, in my opinion, entirely attributable to climatic causes. The mortality percentage is, however, greater, but it can be accounted for by most of the cases occurring amongst the transport mules working on the Coast-road to Zululand, and being attacked at small road-side places without any appliances, and probably only a native driver to look after them.

The tables in "Appendix B" give the different temperatures, rainfall, and state of the barometer for the months from January to February 1887 and 1888, copied from the meteorological observations taken at the hospital at Fort Napier, Pietermaritzburg, and for which I am indebted to Surgeon Major Coates, M.S., who kindly placed them at my disposal.

Although I am of opinion that the cause of immunity this year is due to climatic reasons, still precautions were taken with the Cavalry and Royal Artillery animals, which were not allowed out till after about 7 a.m., dry grass was used for bedding, all grazing was stopped, and dry oat-hay issued instead. The existing stables, which were formerly open sheds of sheet iron, were closed up. These stables are shown in the plan marked "Appendix C," the original portion being in indian-ink; the additional in yellow. This addition consisted of a shutter on hinges, which lifted up and down so as to completely close the opening. The plan shows the ridge ventilation, which was also made to allow the escape of the foul air. The block plan shows the stables to which these shutters were fitted marked in yellow, in the others old horse blankets were fastened into the open space as a substitute. These blankets and shutters were fastened up at 5 p.m. and not opened till 7 a.m., only twenty-six animals being kept in each stable, giving to each a total space of 1,200 cubic feet.

With material obtained from the few cases that occurred in Pietermaritzburg, I made a series of inoculation experiments and cultivations. The former were completely destitute of result, merely confirming those of last year. I made a cultivation in beef peptone broth from blood in which was the usual bacillus. This I kept at the temperature of the room for seventy-two hours, when a profuse growth had taken place. I injected forty minims of the cultivation into the trachea of a horse, puncturing the trachea with the needle of the syringe between two of the rings; but beyond a very slight rise in the temperature, there has been absolutely no result. I found that if the blood of an animal which had died from Horse-sickness, and in which the characteristic bacillus was present, was collected in sterilized capillary tubes or freshly-made glass pipettes, and hermetically sealed, after the lapse of from sixteen to twenty-four hours after death the strings or chains of bacilli split up and separated, each bacillus then presenting somewhat the appearance of a tadpole, having a bright spot at one end looking like a head. Some, but not many, had this spot at either end, giving it somewhat the appearance of a life-preserver in miniature. The tail or shaft took on the stain in a uniform mass, but the spore or head is, I am inclined to think, round, for the centre appeared as a bright spot, colourless, with a faint belt or ring of colour round it. This effect I obtained with an alcoholic solution of Spiller's purple, also with Bismarck brown prepared after Woodhead's formulæ ("Practical Pathology," page 71). This peculiar spore formation, I found, invariably took place in blood preserved in this way, and I think that the same takes place in the body, for in the epizoötic of 1887, in one case in which the blood was collected for me sixteen to twenty hours after death, I found micro-organisms of exactly the same appearance and which at the time misled me very much; as although the case presented at the time all the usual appearances of Horse-sickness in its continued form, the microbe present was totally different to the bacillus I had previously seen. I could detect no sign of motion in the fluid, either during or after this development, although I repeatedly looked carefully for it. With the help of Veterinary Surgeon Raymond, I made a number of tube cultivations, both in beef broth and on "agar-agar," some plate cultivations on gelatine, and also on potatoes, bananas, and pine apples, both of which latter are easily obtainable in Natal; but I could never get the same spore formation that I did in the blood kept in the tubes, although I watched them carefully, but only the minute bacillus and micrococcus I obtained last year, and which in inoculation experiments failed to have any results. In passing, I would remark that, although I found the banana to be an excellent cultivation medium, on pine apples I failed to get any growth at all, which I attribute to the fact that the juice of this fruit has a strong acid reaction, which appears to be antagonistic to this particular microbe. On gelatine plates at the temperature of the room, I found that after the lapse of about twelve hours a peculiar yellowish white, cloudy growth took place, which then spread rapidly, burrowing into the substance of the gelatine, liquefying it, and giving its surface a very worm-eaten appearance. After the lapse of about twenty-four to thirty-six hours, during which time the growth rapidly increases, distinct flocculi or detached pieces of the yellowish white mass break off and float freely about in the liquid gelatine. These flocculi then gradually break down as well, until, finally, after about the fourth or fifth day the cultivation resembles a dip or hollow in the gelatine, with a milky white fluid filling up the pool. I found that the same appearance and growth took place, no matter whether the original sowing was made with fresh blood containing the bacillus, or from blood in which the spore formation had commenced. These experiments were all made at the temperature of the room, as from my experience of last year I found it utterly impossible to regulate the temperature of the incubator without gas, to five, or even ten degrees. I did

attempt to grow cultivations at a regular heat this year, but with the result that one of my lamps, holding nearly a quart of oil, exploded, nearly blowing me up, and setting the whole laboratory on fire. After this I did not think it advisable to make any further attempt in that direction. In fact, as I have previously stated, in an undertaking of this sort it is useless to attempt much without a good and constant supply of both gas and water.

That Horse-sickness is due to climatic causes, I am still of opinion; and in addition to the facts mentioned in my former report, I must now make the following additional remarks. It is well known in the Cape Colony that at one time Horse-sickness was as prevalent as in Natal, and mention is made of its prevalence both in the records of the old Cape Mounted Rifles, and in several reports and pamphlets on the subject that have been published by the Colonial Government from time to time. From these documents, which I obtained access to in Cape Town, it would appear that the disease was universal all over the Colony, except to the northward of Cape Town, on the West coast about the Picquetburg District, the Berg River, and Saldhana Bay, which places, even when the great epizoötics of 1833 and 1852 were at their height, entirely escaped. The immunity of this particular strip of country I attribute to the influence of the Antarctic current running up the Coast, which I gave a map of in my former report.

For the last thirty years, except a few isolated sporadic cases, there has been comparative freedom from Horse-sickness in the Cape Colony, and the following are the reasons that, in my opinion, account for this. It is pretty well universally admitted in the Cape that the character of the herbage on the Veldt has changed, and that most sheep farms have been over-stocked. It is also well known that during wet weather the rivers rise much more suddenly, subside quicker, and that the floods reach a higher level than they did formerly. About thirty years ago or thereabouts was the time that the wool industry commenced, and merino sheep were largely bred and imported into the Colony. From this large profits were made, and in consequence farms were much over stocked.

The chief herbage of the South African Veldt is the Karoo Bush, which is a small shrub about a foot or eighteen inches high, under which, shaded from the heat of the sun, a crop of grass grows. This the sheep fed off, biting it down to the ground in the manner in which these animals graze, and the farms being over-stocked the roots of the grass were destroyed, and hence the change in the pasture. In former times, before this took place, the herbage sucked up the rain when it fell, like a sponge, retaining it in the ground; which, when acted on by a powerful sun, gave rise to the miasma causing Horse-sickness, in the same manner as occurs in the more luxuriant pastures and valleys of Natal. When this grass was destroyed, not only was there less material for retaining the moisture, but the constant passage of the sheep over the land formed what are so well known to any one who has been on the South Downs and other sheep-breeding countries, as sheep walks; and, in reality, the whole country is now covered with a series of open surface-drains. These sheep walks collect the rain, which is drained down into the ravine and watercourses, instead of remaining to be soaked into the earth, and in this way the change of flood-level in the rivers can be accounted for, as well as the alteration in the climate.

It may also be worthy of remark, that the number of cases of fever among human beings is much greater in the South African autumn than at any other time of the year.

A list is given, marked "Appendix D," of a number of animals—ten horses and thirty mules—which I inoculated in June, 1887, with Pasteur's No. 1 and No. 2 vaccine obtained from Paris. These were all animals belonging to the Transport Department, and were taken from that corps; as I thought that,

being moved about all over Natal, they would afford a better test than animals of one corps or regiment always in one place. From the annexed return it will be seen that, out of a total of forty animals inoculated against Anthrax, up to the present, four mules have died from Horse-sickness at the dates given in the return, and that all were working between Durban and Zululand.

During the investigation of Horse-sickness, what I have reason to believe is a hitherto undescribed bacillus affecting the lungs of the horse, came under my notice; and although I am sorry to say I have not had an opportunity of proving it, still I think that there is every probability of its being specific, and that it is more or less connected with a peculiar progressive form of Pneumonia that at one time was almost epizoötic in Natal. I have never seen a case during the time I have been in the Colony, neither could I hear of one, although I have made diligent inquiries. The specimen of lung from which I cut the sections was given to me by S. Wiltshire, Esq., Colonial Veterinary Surgeon, and had been obtained by him from a horse that died about September, 1886, when the disease was epizoötic at the Police Post of Krans Kop, on the River Tugela; where between thirty and forty horses, belonging to both private persons and the Natal Mounted Police, died. As described to me by Mr. Wiltshire, the horse appeared to gradually waste away, losing condition, with a cough, but with no loss of appetite or alteration in the pulse. The progress of the disease lasted, I believe, from a few days to several months, the animal dying from sheer debility. The line of demarcation of the diseased from the healthy tissue was, during life, very clearly marked on auscultation. The lung, which had been preserved in a solution of corrosive sublimate when given to me, presented somewhat the appearance of a portion of cow's udder. The pleura was much thickened and adherent to the organ, the parenchyma being intersected with a number of fibrous bands, varying in breadth from a few lines to $\frac{1}{16}$ of an inch, running all over it in no particular direction. When stained with Ranvier's Picrocarmine, there was seen to be irregular consolidation of tissue in patches, with cell proliferation into the walls of the alveolæ, which, by the increasing thickness of the walls, became gradually obliterated. These patches were distributed all over the organ. In some, but not many, of the smaller bronchii there were casts, but these did not entirely fill up the tube, there being a space or margin round them, but it is possible that the reason of this is that the cast has shrunk, owing to the length of time the lung had been preserved. When stained by Gram's method with iodine, the bacillus I have mentioned was rendered visible, taking on a deep blue, almost black colour, which was rendered more prominent when the matrix was stained with an alcoholic solution of resine. This bacillus is a small rod-shaped body, about three or four times longer than it is broad, and much smaller than a red blood-corpuscle; but as I have not a micrometer with me I am not able to give the exact measurements, but trust to be able to do so on my return to England. The bacilli are not uniformly distributed all over the tissue, but in patches; in places they are single, that is to say, there are inter-spaces with a small portion of tissue between each individual microbe, and in others they are in clusters, large, many of them together in patches. Where these patches are, the deep blue colour they assume is most striking, especially if the section is doubled stained with resine. I tried a number of other re-agents and methods of staining, but Gram's was the only one by which I could demonstrate it. Of course, without cultivation in inoculation experiments, it is impossible to state positively that this bacillus is the same, or even connected in the most remote manner, with the disease; but in all probability it is. At all events, in this particular case there is an organism present which is not there under normal conditions, and that there is something specific about it, is proved by its only becoming visible when stained by one particular method; and as of course you are aware, without a fresh

case from which material could be obtained it would be impossible to make these experiments. This I regret to say I could not do, for although I inquired far and wide, I was unable to hear of a single case during my stay in Natal.

During the autumn, what is commonly known as South African distemper, is very prevalent and fatal with dogs, especially adult animals imported from England, which are almost certain to be attacked during the first year they are in the country. I have, from the result of a number of cases, come to the conclusion that, although it somewhat resembles European distemper, it is nothing more than a continued fever of a somewhat peculiar type, running in periods of seven days, when a crisis takes place. During the attack the temperature rises to 104 or 109 deg. F., with a regular variation night and morning of about two deg. I merely mention this fact to show that, at this time of year, there is some peculiar atmospheric condition exerting its influence.

In concluding this report, I must tender my best thanks to Veterinary Surgeons, 1st Class, Rowe and Crawford, A.V.D., the former of whom, as Senior Veterinary Surgeon in Natal, gave me every assistance in his power, and without whose hearty co-operation I could not have carried out this inquiry; while the latter greatly assisted me in making *post-mortem* examinations and noting cases. Veterinary Surgeon Raymond, A.V.D., also gave me valuable aid in the sickly season of 1888. That officer having gone through a special course of instruction in Bacteriology in England, was able to confirm and carry out many observations for me which I should not otherwise have been able to do; as my eyesight has been so injured by the microscope work I did in the Horse-sickness season of 1887 in Natal, that I cannot now look through the instrument for any very great length of time.

My thanks are also due to Surgeon-Major J. Coates, M.S., who kindly placed the Meteorological observations taken at the Military Hospital, Fort Napier, Pietermaritzburg, at my disposal, and to S. Wiltshire, Esq., Colonial Veterinary Surgeon, who gave me much valuable information and collected a number of specimens for me.

I have the honour to be, sir,

Your most obedient servant,

(Signed) JOSHUA A. NUNN,

Veterinary Surgeon 1st Class, Army Veterinary Department.

APPENDIX A.

Corps.	Cases.	Deaths.	Recoveries.	Date of First Case.	Date of Last Case.	Place.				Mules.	Horses.	Remarks.
						Pietermaritzburg.	Durban.	Rorke's Drift.	Zululand.			
6th Dragoons.....	3	3	—	Mar. 10	May 18	2	—	—	1	—	3	
H 4 R.A.....	2	2	—	Feb. 28	Mar. 31	2	—	—	—	1	1	
Mounted Infantry, Inniskilling Fusilrs.	2	2	—	Feb. 25	April 22	1	—	—	1	—	2	
Mounted Infantry, N. Stafford Regt....	5	5	—	Mar. 20	May 22	—	—	2	3	—	5	
Transport Corps ...	57	57	—	Feb. 13	June 1	3	17	—	37	53	4	
Total	69	69	—	—	—	8	17	2	42	54	15	

APPENDIX B.—*Meteorological Chart.*

1887.	Jan.	Feb.	March.	April.	May.
AVERAGE TEMPERATURE, 9 A.M., LOCAL TIME.					
Dry Bulb	71·8	73 2	69·5	67·7	61·8
Wet Bulb	66·2	67 3	65·2	63·1	59·1
AVERAGE TEMPERATURE, 3 P.M., LOCAL TIME.					
Dry Bulb	76·9	74·9	74·1	72·7	69·2
Wet Bulb	69·7	69 7	67·0	63 8	60·7
RAINFALL.					
Average number of inches	·21	·40	·34	·6	·03
Average duration of hours	·70	2·0	1·75	·4	·4

1888.	Jan.	Feb.	March.	April.	May.
AVERAGE TEMPERATURE, 9 A.M., LOCAL TIME.					
Dry Bulb	71·8	73·3	68·4	68·4	60·7
Wet Bulb	64·1	67·2	63·0	62·2	54·1
AVERAGE TEMPERATURE, 3 P.M., LOCAL TIME.					
Dry Bulb	74·4	78·8	72·4	74·7	69·4
Wet Bulb	65·8	70·4	65·2	65·8	56·7
RAINFALL.					
Average number of inches	·2	·42	·21	·09	·04
Average duration of hours	3·0	1·9	1·91	·9	·62

APPENDIX B—*continued.—Meteorological Chart.*

1887.	Jan.	Feb.	March.	April.	May.
Highest reading of barometer	30·027	30·022	30·244	30·178	30 291
Lowest do. do.	29·518	29·562	29 651	29 602	29·560
Highest temperature in shade	100 8	96·0	90·0	89·0	82·5
Lowest do. do.	54·5	50·5	47·0	38·5	40·0
Highest temperature in sun	152·4	148 0	145·0	135 8	116·8
Lowest do. do.	49 0	40·0	41·5	31·5	30·8

1888.	Jan.	Feb.	March.	April.	May.
Highest reading of barometer	30·119	30·060	30·243	30·176	30·092
Lowest do. do.	29·522	29·631	29 625	29·612	29·549
Highest temperature in shade	100·4	95·0	95·0	93·5	86·0
Lowest do. do.	51·2	50·0	42·0	50·5	38·5
Highest temperature in sun	157·4	148·4	142 8	134·0	140·5
Lowest do. do.	43·0	46·0	32·0	40·0	30·5

APPENDIX D.

Description and number of animals inoculated with Pasteur's Anthrax vaccine.

No.	Colour.	Sex.	Remarks.
Horses 489	Bay	Mare	
465	„	Gelding	
451	Chestnut	„	
482	Bay	Mare	
404	Grey	Gelding	
455	Bay	Mare	
479	„	Gelding	
433	Grey	„	
303	Bay	„	
187	„	„	
Mules 2183	„	„	Died of Horse Sickness at Etchowe, Zululand, 12th February, 1888.
106	Mouse	„	
99	Dark bay	Mare	Died of Horse Sickness at N. Noujeni, Zululand, 4th May, 1888.
54	Bay	„	
118	Brown	Stallion	
2636	Bay	Gelding	
119	Mouse	Stallion	
89	Dark brown	Gelding	
108	Brown	„	
110	„	„	
36	Light brown	Mare	
84	Dark „	Gelding	
32	„ bay	Stallion	Died 20th July, 1887.
1771	„ „	Gelding	
92	Brown	„	
111	„	„	
93	„	„	Died of Horse Sickness at N. Tongenani, Zululand, 10th February, 1888.
91	Dark brown	„	
94	Light bay	„	
114	Brown	Mare	
120	„	„	Died of Horse Sickness at Durban, Natal, 30th April, 1888.
44	Dark brown	„	
10	„	Gelding	
68	„	„	
736	Brown	„	
2708	„	„	
82	Dark brown	„	
1849	Brown	Mare	
2667	„	Gelding	
25	„	„	

ON THE MODE OF ACTION OF THE CONTAGIUM AND THE NATURE OF PROPHYLAXIS IN SOME INFECTIVE DISEASES.

BY G. F. DOWDESWELL, M.A.

(*Continued from page* 105.)

That no general conclusion can be drawn from the mode of action of a pathogenic or prophylactic agent in any particular instance is shown by the kindred case of the acetic fermentation, when the same result is produced by two widely different agents—viz., either by the action of a living organism, the *mycoderma aceti*, or as easily by the mere "contact action" of an insoluble and inorganic substance, spongy platinum; but if such a substance by its mere presence in this case can effect the chemical decomposition of the molecule, it is surely not difficult to conceive that the actively metabolic cells of living microbes, the contagium of infective disease, can as readily exert an influence on the delicate cells of the tissues and pre-eminently sensitive nervous elements. This view, therefore, of functional adaptation or acquired toleration of the action of a virus appears the most probable explanation of the cause of prophylaxis or insusceptibility to an infective disease, such as Variola, Anthrax, or Chicken Cholera, by the *previous* action of a modified virus; it might, too, be supposed to apply to the case of protection against the effects of *previous* inoculation with a virulent contagium when the latent period is prolonged, as in subcutaneous inoculation with Street Rabies, where the protective virus, as employed and advocated by M. Pasteur, though modified and attenuated by partial desiccation, is yet of materially shorter incubation period than the former, though unmodified, and may be conceived so to act as gradually to inure the tissues of the animal to the action of the more virulent; but this cannot be supposed to apply to the case of intracranial inoculations with virus of the same character and intensity.

M. Pasteur's view of the *modus operandi* of his modified virus in Rabies appears to be that in inoculations with it *after* infection it acts in precisely the same manner as in those made *previously* to infection, but that it develops more rapidly than the lethal or unmodified virus—"the one which is living"—the fatal microbe—the action of which, "when present in sufficient quantities," it inhibits. This view, *per se*, offers nothing contradictory or impossible, but it is inconsistent with the measures adopted—viz., a graduated series of progressively less modified, or more virulent, medullas, so as *gradually* to inure the subject to the action of the unmitigated and most virulent, which obviously implies a physiological action of the modified or attenuated virus itself, not that of a chemical or unorganised antidote, as the theory of M. Pasteur requires, according to which it would have been requisite to have employed, whether once for all or repeatedly, a "sufficient quantity" of the antidote at its state of maximum development, and the lethal, "organised" virus at its *minimal*, without using medullas containing the latter, but little, if at all, modified. The practice thus contradicts the theory, and one or other falls to the ground.

There is, too, another circumstance that creates a difficulty in accepting the view of the occurrence of any prophylactic action in these inoculations for Rabies, which is that in all other cases, as in Variola, Anthrax, etc., when protection or immunity from subsequent infection is conferred, it is by exciting an abortive or modified form of the disease; but here, neither after inoculation with the so-termed modified nor with the unmodified virus, either in the dog, or in those and exceptional cases in the rabbit when they are not fatally infective, are there any appreciable symptoms of disturbance, so that there appears equal difficulty in accepting this view of prophylaxis as that of M. Pasteur of the action of an antidote or counter poison, and the most that

can be said is that the disease is one *sui generis;* and if the occurrence of an induced immunity from, or an increased refractoriness to, infection be accepted, it must be admitted that we are as yet in complete ignorance of the mode of action, and that the case is altogether anomalous.

It may well be, however, that in different infective diseases the action of the virus or even its nature may be different; in one case its pathogenic action may be mechanical, as by causing embolism, or by deoxidising the tissues, when the microbe is present in overwhelming numbers throughout the blood; in another, when absent from that fluid, as in Tuberculosis and in Rabies, where the blood is not usually infective, it most probably acts in a totally different manner. Similarly, the *modus operandi* of protection in different diseases may be diverse. It is remarkable how little attention this subject—of the nature of the virus, and its mode of action when modified and unmodified—has received; and yet, if the methods of prophylaxis and therapeusis are to be anything but empirical, it is the basis on which they must be founded. For this reason I have dwelt at some length upon this point.

It is somewhat singular that at the present time, and within a very short period, articles have appeared by three different writers, denying in effect to micro-parasites any etiological relations to disease. It is quite superfluous now to repeat the evidence of their direct pathogenic action in some few cases, the proof of which was first completed with logical conclusiveness in the case of Anthrax by Dr. Robert Koch upwards of ten years ago, and must be universally known. Possibly the utterance of these opinions arises as a protest against the tendency, which has become too apparent, greatly to exaggerate the number of cases in which it can be shown that microbes have any casual relation to the diseases in which they appear, and which tendency has brought bacterial pathology into some disrepute, though these mistaken observations or statements do not affect those cases, few in number though they be, in which their relations are conclusively shown. Partly also perhaps it may be due to a feeling of disappointment with the *practical* result of work upon this subject. It was reasonably hoped that, when the active cause of infectious disease was demonstrated, a certain basis for its remedial treatment would be afforded; this hope has been utterly disappointed. Increased attention to sanitary measures has, it is true, to a great extent mitigated the prevalence of some of the most dreaded epidemic and epizoötic diseases, but it has done so perfectly irrespective of the results of micro-pathological investigations, and any conclusions as to the nature of the contagium. Amongst these disease, Asiatic Cholera and Enteric Fever, which has been rightly termed "the scourge and the opprobrium of civilisation," have both yielded in great measure to sanitary precautions, and these diseases are amongst those of which we are as yet in absolute ignorance of the nature of the contagium. In France, indeed, in the epizooties, Fowl Cholera and Anthrax, methods of prophylaxis have been perfected by Toussaint, Pasteur, and others, as the result of scientific experiment and microbial investigation, and, it is understood, are practised and found successful upon a large scale; but in this country they have been contemned and discouraged by a memorandum of the Privy Council, which regards them as practically useless and liable to propagate the virulent disease.

It has lately been said by a most eminent authority in medicine and pharmacology, in relation to the action of bacteria, that the future of medicine will be rather preventive than remedial; but experience as yet goes to show that this consummation must be rather due to general matters of sanitation than to any conclusions founded upon ætiological or microscopical investigation*. This disappointed expectation is strikingly exemplified in the

* Somewhat singularly, however, the same authority endorses the conclusions of Professor Rosenberger that injection of a chemical poison (sterilised septic blood)

circumstance that the demonstration by Koch of the micro-parasite of Tuberculosis, which discovery has been characterised as one of the greatest achievements in medical science of the present age, has been utterly unproductive of the very smallest improvement in the treatment of the most dire disease prevalent in this country. Beyond that, too, the result of experiments upon the lower animals is directly at variance both with clinical observation and daily experience; and if it be admitted that the microbe is in a strict sense the efficient cause of Tuberculosis when inoculated in man as in some of the lower animals, there must be a third factor, as yet unrecognised, in the natural means of infection by this disease; were it not so, it is obvious that infection would infallibly follow from any protracted communication with a tuberculous patient, a result which, in the majority of cases, is contradicted by everyday experience. Quite recently, too, it has been shown, as is asserted, in two different investigations, that in Scarlatina a microbe is the *materies morbi;* and yet, as if to demonstrate the practical inutility of these investigations, we are immediately upon the statement visited by as severe and unmanageable an outbreak of this disease as has occurred for many years.

As a further instance of the extreme confusion and conflicting views prevailing on this subject may be adduced the case of Swine Fever, in which different observers—as Klein, Pasteur, Loeffler, and Salmon—have described totally distinct organisms as constituting the contagium; and whatever may be the explanation of this, it is quite obvious that the results and conclusions published on this point are worthless. This is disappointing enough, and demonstrates that the result of these investigations is directly antithetical to the object of the experimental method inaugurated by Bacon, which was "humanis commodis inservire," as opposed to the previous philosophy of the schools, the futile and selfish aim of which was to exercise the mind in the pursuit of abstract truth. But, even from a theoretical or merely scientific point of view, the results of the last ten years' laborious investigations are equally disappointing. In no case (not even in the best known

will produce a disease in the rabbit, with the presence of a micro-organism, which has been regarded and demonstrated, as conclusively as in the case of Anthrax, to constitute the efficient contagium. The result of this conclusion, stated explicitly by Professor Rosenberger (Centralb. f. d. Med. Wiss., 1882, No. 4, p. 65-69), is to deny any casual connection with the diseases in which they appear to microbes, and to regard them as merely adventitious or "epiphenomenal." It is not requisite here to discuss the particular case, which I have already done (Proc Roy. Soc., 1882, No. 221), but I adduce it as an instance of the present chaotic position of opinion upon this subject; and if these conclusions be accepted, as showing that these micro-pathological investigations, or those on the action of antiseptics or other agents upon microbes that have been regarded as pathogenic or parasitical, are futile, and no conclusions in either preventive or remedial medicine can be founded upon them: I am far, however, from questioning the general proposition that modifications of its environments, such as impaired vitality of the tissues, do affect the development of many so-termed pathogenic microbes. This was shown conclusively many years ago by M. Chauveau (Bull. Acad. Med., 1873, p. 523, etc.) in experiments upon Bistournage in rams, with results that must be familiar to every student of micropathology, though there has appeared to be a tendency with some writers lately to represent this old-established conclusion as new; whilst the most recent experiments upon this point—those of MM. Arloing, Cornevin, and Thomas—do but confirm, if they somewhat extend the original conclusions of M. Chauveau. But what I deny explicitly is that in a true micro-parasitical disease, such as Anthrax, or the case here in question, Davaine's Septicæmia in rabbits, where the blood is the seat of the contagium, the specific microbe, as asserted by Rosenberger, is present normally in the blood, or can be produced or enabled to develop in that fluid by the action of a sterilised chemical substance. In the case of Anthrax, however, similar assertions have been made by Professor Semmer, of Dorpat, and his pupils (Centralb. f. d. Med. Wiss. 1884, p. 401, etc., *et ubique*). Their results have obviously proceeded from the same cause as those of Rosenberger—viz., imperfect sterilisation of the fluids injected—and they have rightly received no credit.

micro-parasitical disease—viz., Anthrax) is it finally demonstrated or generally agreed what the *modus operandi* of the contagium is, and the general position of the subject cannot be said to have advanced beyond that described by Dr. Burdon Sanderson* just ten years ago.† I will only add, with respect to Rabies, that, unsuccessful for 2,000 years as have been all remedial measures hitherto tried, I can see no reason to conclude that effective treatment may not be practicable when we have acquired a competent knowledge of the intimate nature of the virus and its mode of action.

P.S.—The views herein expressed of the unsatisfactory position and uncertain results of bacterial pathology, have quite recently, and since the above was written, received a striking confirmation by the conclusions at which Dr. Crookshank has arrived, in continuation of the opinion he shrewdly but guardedly expressed in the last edition of his "Bacteriology" (second edition, 1887, note, p. 201). From an exhaustive examination of many different investigations in this field, he brings the sweeping charge against several writers of having described as the active contagium in upwards of twenty different cases a common ubiquitous saprophyte, the streptococcus pyogenes. In at least many of the cases so carefully collated, there is certainly strong probability of his conclusions being well founded; and the fact that such an assertion could possibly be made by a competent bacteriologist shows conspicuously the fundamental ignorance that prevails upon the subject, and that such investigations conducted upon the prevailing methods are not merely useless, but misleading. This charge cannot be ignored or slighted, and if unanswered and unrefuted will constitute nothing less than a grave scandal. The cause of this prevailing obscurity and confusion is obvious; it arises from the neglect of, or inability to recognise, the specific characters of form and habit in the microbes regarded and described as pathogenic in these cases; in some instances—though to specify them would be invidious—inattention to these microscopical features has resulted in organisms which, comparatively speaking, are conspicuously dissimilar, being regarded and described as one and the same. This specific diagnosis should obviously form the basis of all reliable micro-pathological investigation, in the place of a restless anxiety to publish new and sensational results, however crude—as indeed, I endeavoured in numerous places for several years to inculcate. To do this is by no means impossible, with competent observation and adequate appliances; and if it continue to be neglected these investigations will remain useless, inconclusive, and misleading.

THE PASSAGE OF MICROBES FROM THE MOTHER TO THE FŒTUS.

THE greater number of infectious diseases are now regarded as capable of being transmitted from the mother to the fœtus, and numerous facts, clinical and anatomical, have been recorded, which prove that the germs of Variola,

* The *Lancet*, Dec. 29th, 1877, p. 968.

† The method, however, of prophylactic inoculation for Anthrax and for Charbon Symptomatique (Quarter-evil) in sheep and cattle, by intravenous injection of small quantities of unmodified virus, as first recommended by M. Chauveau and by Messrs. Arloing, Cornevin, and Thomas respectively—since adopted and employed upon a large scale by the practical genius of M. Pasteur—is said to have been investigated at the Royal Veterinary College and found to be successful, whilst the methods of inoculation with a modified or attenuated virus have been unsuccessful. Though the first method may be termed scientific, I should rather consider it empirical; it is at least absolutely independent of the nature of the virus, and of any bacteriological investigations; indeed, in the latter disease (Charbon) the nature of the contagium is not yet conclusively demonstrated; the microbe which appears in animals so infected does not appear to constitute *per se* the true *materies morbi*, as in the case of the bacillus of Anthrax, where the blood is the seat of infection.

Syphilis, Tuberculosis, Scarlatina, Measles, Glanders, Pneumonia, Erysipelas, Recurrent Fever, Anthrax, Typhoid Fever, and Cholera may overcome the barrier formed by the placenta, and infect the embryo; and, on the other hand, the experimental transmission to the fœtus of the microbe of Symptomatic Anthrax and Fowl Cholera inoculated into rabbits, the Septikæmia of rabbits, Pyæmia, the so-called "Rouget," and Tuberculosis. In every case, it is true, the micro-organisms found in the fœtus were relatively few; but their presence, nevertheless, showed that we cannot regard the placenta as a perfect filter, protecting the fœtus under all circumstances against bacillary invasion.

In favour, however, of the authorities who maintain the contrary opinion, it is only just to note the small number of cases observed, at least for certain diseases; for we know, for instance, that the Anthrax bacillus very rarely passes from the mother to the fœtus.

M. Malvoz has published, in the *Annales de l'Institut Pasteur*, the results of the researches undertaken by him to solve the much-discussed problem, and to discover the conditions of a transmission which might present itself with very marked contingent characters. The conclusions of this authority are to the effect, that the passage of micro-organisms through the placenta is dependent upon anatomical lesions of that organ, that such transmission cannot be considered a constant fact, and that it is as variable and inconstant as the properties of the parasitical elements themselves.

Thus the placental alterations, inconstant in Anthrax and variable from one species of animal to another—which explains the apparently contradictory results obtained by experimentalists—should, on the contrary, be the rule in such diseases as Symptomatic Anthrax, and especially Fowl Cholera, in which transmission of the microbe to the fœtus has been pretty constantly observed. If such conclusions are applied to maladies such as Variola, Tuberculosis, Pyæmia, etc., it will be seen that the fœtus is imperilled every time there occurs any alteration likely to break down the cellular barriers of the placenta: a hæmorrhagic point, so frequent in Variola; softening of a nodule in Tuberculosis; a purulent focus in Pyæmia. And in evidence of this, it has long been remarked that Variola in the pregnant woman always manifests itself in the hæmorrhagic form, a circumstance which explains the placental lesions and the already numerous instances of transmission of the disease to the fœtus.

The anatomical observations of M. Malvoz have convinced him that, in a condition of integrity, the placenta, like the kidneys, is a perfect filter. But in the majority of infectious maladies, the accumulation of the microbes in these organs and their proliferation *in situ*, tend to produce rupture of blood-vessels, which breaks the perfect barrier formed by these organs, and thus opens doors of entrance for the micro-parasites into the fœtus, when the placenta is involved. But then it is by effraction, and not by filtration, that these parasites penetrate, and this circumstance is sufficient to explain the inconstancy of the phenomenon.

TRANSMISSION OF STRANGLES FROM THE MARE TO THE FŒTUS.

At a recent meeting of the Société Centrale de Médecine Vétérinaire of Paris, it was stated that M. Choisy, Veterinary Surgeon to the 10th Cuirassiers, had sent to the Society the organs of a foal which died a few minutes after birth. The lungs and the small intestines and their lymphatic glands were the seat of numerous lesions, apparently neoplastic, whose nature a macroscopic examination could not decide. The mother of the foal had been affected with

Strangles during the period of gestation. Professor Nocard made a careful examination of them and reported the result. The idea of a neoplasm—such as Cancer, Sarcoma, Epithelioma, or Lymphadenoma—was not entertained. Koch's bacillus was not found, neither was that of Löffler; therefore the case had not been one of Tuberculosis or Glanders. But in having recourse to Weignert's method of staining with two colours, he recognised in the degenerated masses which filled the pulmonary alveoli or infiltrated the intestinal mucous membrane, the presence of an enormous quantity of isolated micrococci, geminated or associated in short chains. It is now known that the pus of Strangles lesions constantly contains a similar micrococcus, which can be cultivated, and by means of which Professor Schütz, of Berlin, could produce Strangles in horses which had not been previously affected by that disease. It was therefore very probable that the lesions examined by Nocard were those of Strangles, and that this was the first case of the kind observed.

At a subsequent meeting of the Society, Professor Nocard said that, contrary to what he had previously stated, Glanders had been already observed in the new-born foal, and M. Martin, in an "Etude sur la Pyogénie Spécifique appelée Gourme du Cheval" (Bayeux, 1887,) had written: "When a mare foals within fifteen days after her recovery from Strangles, the foal at birth has the disease of which its mother appeared to be cured when it was born. This virulent heredity is very frequently fatal to the foal, which dies exhausted by the abscesses that multiply on all parts of its body." But Nocard remarks that Choisy's case was different, as the lesions, besides their special characters, were all internal.

PREVENTIVE INOCULATION FOR ANTHRAX.

M. ROSSIGNOL, veterinary surgeon at Melun, France, under whose auspices, it will be remembered, the first practical and startling demonstration of the value of Pasteur's system of protective inoculation for Anthrax was made, has lately been conducting some new experiments in the same direction, a report of which appeared in *L'Avenir* of June 10th. For several years Rossignol had found it absolutely impossible to inoculate, at the proper time, herds which were in jeopardy from attacks of Splenic Apoplexy, because no "vaccine" could be obtained from Pasteur's laboratory from August 1st to October 15th, the period when the risk of the disease is greatest.

A deadly outbreak which occurred amongst the herds and flocks of a farmer in his vicinity last year, convinced Rossignol that some means should be adopted to remedy this omission, and he determined to try a new "vaccine" made by means of compressed oxygen by M. Chauveau, of the Institute, Professor at the Museum, and Inspector-General of the French Veterinary Schools. This "vaccine" was tried on the stock of the farmer alluded to, under the auspices of the Agricultural Society of Melun and the Society of Practical Veterinary Medicine, on May 5th, and the results were pronounced satisfactory, taking into consideration the facts that the trial was made during an epizoöty of the disease, and that the material had been prepared nine months. The arrangements for the trial were made in concert with M. Chauveau, and were as follows: (1) Fifty sheep were to be bought for the purpose. (2) Ten of these were to be inoculated for the *first time* on May 5th, with the virus attenuated by means of compressed oxygen, and a *second time* ten or twelve days afterwards. (3) Ten other sheep to be inoculated for the first time with the same virus, on the day when the first lot received their second dose. (4) Twenty sheep to be inoculated with the classical "vaccine" of Pasteur, the inoculation with the first "vaccine" to be made on May 5th, and the second at the same time as that on which Chauveau's two lots were to be operated on. (5) Ten or twelve days later the forty sheep of

the Chauveau and Pasteur lots were to undergo a test inoculation with very virulent Anthrax virus. (6) Ten uninoculated sheep were to be inoculated at the same time with the same virulent virus.

On May 5th, in the presence of a large number of veterinary surgeons and agriculturists, the twenty sheep of the Pasteur lot were inoculated with the first "vaccine" on the inner surface of the left thigh, by means of a Pravaz syringe. The Chauveau lot of twenty sheep were divided into two sections, of ten each. The first section of Chauveau's lot received as much of his prepared virus as would have sufficed for twenty sheep, as from the long time it had been kept he was apprehensive that it was too attenuated. On the following days the temperatures of these sheep indicated a certain amount of fever, and on the third day one of the Chauveau section died; the autopsy showed that death was due to the inoculation.

On May 19th, M. Chauveau, several veterinary professors, practitioners, and agriculturists, were present when Pasteur's lot received their second vaccination. The first Chauveau section received also a second inoculation with the same virus as on the first occasion. The second section were likewise inoculated, but the dose of virus was only one-half of that used for the other section. The consequent febrile condition was more marked than before in the Pasteur lot and the first section of the Chauveau lot; a Chauveau sheep of the second section died on May 27th, eight days after the operation. Subsequently M. Chauveau held a conference, at which he explained that the principal object he wished to attain under the present conditions, was to prove that his prepared virus would retain its activity for several months, which is not the case with Pasteur's, the duration of which is absolutely ephemeral. Chauveau's virus had been already successfully employed in the most distant colonies, and the Swiss veterinary surgeons had advantageously employed it without the slightest accident resulting. The accident which had occurred at this trial indicated that vaccine more than two months prepared should not be employed, as beyond that time it regained a certain activity which might cause untoward results.

On May 31st, the forty-eight sheep (twenty of the Pasteur, and twenty-eight of the Chauveau lots, and ten test sheep) were inoculated with virulent Anthrax virus obtained the previous evening, before a large number of witnesses. On June 1st the sheep did not appear any the worse, but on the morning of the 2nd one of the test animals was found dead, and in the evening two more died, presenting all the symptoms of Anthrax, and bacilli were found in their blood. On June 3rd two more test sheep succumbed, and next day two more. The remaining three were very ill, but ultimately recovered.

All the sheep inoculated with the virus prepared by Pasteur and Chauveau alike resisted the test inoculation, and if the success had been less with the Chauveau virus, it was nevertheless proved that it could confer immunity when prepared more than three months—a very important point.

M. Rossignol draws the following conclusions from the trial: (1) That they are a new triumph for Pasteur's method. (2) It is a matter for regret that agriculturists cannot derive any advantage from the method except for two and a half months. (3) The "vaccine" prepared by compressed oxygen (Chauveau's procedure) possesses incontestable prophylactic properties. The immunity conferred by it is as substantial as that given by the Pasteur "vaccine." (4) Chauveau's "vaccine" possesses, among other precious advantages, that of preserving its activity intact during several months, of conferring immunity after one inoculation, and may be sent long distances, so that it may be employed uninterruptedly at all times. (5) The two failures that occurred in the trial demonstrate the utility of a new experiment being made with a virus prepared for more than a month. If, as Chauveau affirms, the virulence is attenuated in a precise and invariable manner during the first two months

after its preparation, there will be a considerable advantage; for Pasteur confesses that his second "vaccine" may, when it is inoculated, kill fifty per cent of the animals, and veterinary surgeons who use it consequently incur great risks, which is not the case with Chauveau's "vaccine." (6) The "vaccine" obtained by the aid of compressed oxygen in not causing in cattle and horses the œdemas too often observed in the Pasteurian inoculations, experiments should be made on the horse, and if they are successful recourse could then be had to this "vaccine" instead of that of Pasteur, which is not always satisfactory, as it very often gives rise to considerable swellings which are sometimes followed by death. (7) The doses of Chauveau's virus have been too great, and only one drop should be inoculated in the sheep, two to four in horses and cattle.

PROTECTIVE INOCULATION FOR ANTHRAX IN SOUTH AMERICA.

A CORRESPONDENT to an agricultural contemporary sends the following interesting account of experiments for the prevention of Anthrax in the Argentine Republic:—

"In consequence of very serious losses from Anthrax that we were suffering on a sheep and cattle farm in the province of Entre Rios, in the Argentine Republic, in which I am interested, we, some three years ago, got Dr. Roy to go out there and satisfy us as to the nature of the disease that was devastating the flocks and herds to the extent of over one per cent. per month, for months at a time. He at once pronounced the disease to be (what we had, of course, suspected, namely) Anthrax, and he endeavoured to prepare a vaccine through the animal called a 'biscache' there, and through guinea-pigs, mice, etc., with which we supplied him. After a few months he returned to England, having been unable to prepare a vaccine that would protect our animals. In this strait, and as our animals continued periodically to die in large numbers, we arranged with the laboratory of M. Pasteur to furnish us with an operator and the necessary supply of vaccine in tubes, and this person repaired to Buenos Ayres to work under our orders. He, however, managed to embroil himself with the authorities there, who placed a strict injunction on our practising, on the plea that we were about introducing a new disease into the country. For the best part of two years we debated this point with the authorities, cattle and sheep dying all over the Republic of the disease the whole time; at last, however, we were successful, and we got permission to make the experiments on our own estancia (sheep-farm), under the supervision of a person named by the Government as an expert, whose orders were to report the result to the Government as soon as complete. These experiments were duly made this time last year, and were of so very convincing a nature that when the result was reported the Government at once gave us permission to practise; and as I see the disease is becoming common in England, or rather, perhaps, is becoming more commonly acknowledged, whilst I have not seen in any of the reports so far any recommendation made to adopt or even to try M. Pasteur's vaccine, I venture to relate our experience.

"Our belief is that the disease is much more fatal in sheep than in cattle; but it should be observed that the poisoned blood with which we endeavoured to infect our cattle was sheep blood; and although I don't know why the blood of cattle was not used to infect cattle, I think the experiment would perhaps have been more conclusive on the cattle had blood from their own species been used.

"The experiment on the sheep is too remarkable to need any comment from me, and will speak for itself. The operations began on May 14th, 1887, and ended on June 24th, 1887, and were witnessed by the delegate expert named by the Argentine Government, our own manager, the operator from

M. Pasteur's laboratory, and no less than ten of the neighbouring sheep and cattle farmers, who all signed the diary of what took place, and which diary formed the basis of the report upon which the Argentine Government subsequently acted in giving us the permission to practise, and it is from that diary that I quote the following facts:—

"'May 14th, 1887.—25 steers, 1½ to 2 years old, 25 heifers or young cows, 2½ years old, 19 mares were vaccinated, some with No. 4 and some with No. 6 (two different preparations) of M. Pasteur's vaccine.

"'May 27th, 1887.—All the above animals were revaccinated with the corresponding second qualities, and this completed the protecting process.

"'June 18th, 1887.—The above 50 beasts and 19 mares were inoculated with Anthrax virus.'

"Forty-seven of the beasts were inoculated with virus whose killing power had been satisfactorily tested beforehand, and whose power will speak for itself. When I come to the sheep experiment, which was made with the same virus, it was made from sheep's blood prepared and tested in a laboratory in Buenos Ayres. The mares were inoculated with the same. The remaining three beasts were inoculated from the fresh blood of a sheep that had died of Anthrax this morning (June 18th) on the farm.

"'June 24th, 1887.—The whole of these animals, cattle, and mares never sickened, were alive and well this day, when the experiments ended, and continued well afterwards.'

"As against the above experiments, and to prove their efficacy, on—

"'June 18th, 1887, 37 steers, 10 cows, and 10 mares were inoculated with the tested sheep's blood, like the protected animals above described (3 of the steers, however, were done with the fresh sheep's blood collected this day).'

"Of these animals—

"'June 21st, 1887, 1 steer died of Anthrax.

" 22nd, " 3 " " "
" 22nd, " 2 cows " "
" 23rd, " 2 " " "

"And besides the above casualties, a large number (not given in figures) were ill the whole time, some of them dangerously so—*i.e.*, in a very high state of fever, described as 'violent.' After the 23rd the animals alive recovered gradually, and no more deaths were reported.

"None of the mares died, but all were highly fevered and swelled at the point of inoculation.

"We now come to the sheep experiments:—

"'May 14th, 1888.—48 wether sheep, two years old, were vaccinated with M. Pasteur's Nos. 4 and 6 vaccine.

"'May 27th, 1888.—The above 48 sheep were revaccinated with the corresponding second qualities of vaccine, thus completing the protective powers.

"'June 18th, 1888.—Of the above, 40 were inoculated with the poison virus from the tubes prepared in Buenos Ayres; 3 were inoculated with the blood of the recently expired sheep alluded to; 5 were put on corn diet, over which half a tube (50 doses) of the active virus was twice mixed during the week of trial.'

"With the exception of a slight increase in the temperature on June 20th in some of these animals, the whole of the 48 continued well and hearty until June 24th, when they were discharged sound in every way (and continued so, as far as I know).

"'May 27th, 1888.—10 more wethers besides the above were vaccinated (only once, observe), and with Pasteur's second quality of vaccine only.

"'June 18th, 1888.—9 were inoculated with the active virus from the tube, the other one having died on May 31st, apparently from Anthrax, but whether acquired from the inoculation or from having had the disease at the time (it being prevalent) cannot be ascertained.'

"The nine continued well and hearty until June 24th, when they were discharged as sound.

"'June 18th, 1888.—20 unprotected wethers were inoculated with the tubed virus, 3 unprotected wethers were inoculated with the blood of the freshly dead sheep already twice alluded to, and 5 were put with the previous 5 sheep on the poisoned food.'

"Of the above 28 animals—

"'June 19th, 1888.—19 died of Anthrax.

"'June 21st, 1888.—1 died of Anthrax.

"'June 22nd, 1888.—3 died of Anthrax.'

"Which accounts for the whole of the 23 that were inoculated. The history of the remaining five fed on poisoned corn I cannot distinctly trace, but I should gather that the corn had not affected them."

STRONGYLUS PARADOXUS.

M. J. CHATIN recently exhibited before the Paris Académie de Médecine, a specimen of this intestinal worm, passed by a butcher, at Oloron, in the department of the Basses-Pyrénées. The patient had been subject for some time to gastro-intestinal disturbance, and had already passed another specimen of the same parasite. *Strongylus paradoxus* is a small round worm; the exhibited specimen measured a little over half an inch. The species was discovered in the lung of a wild boar, by Ebel, at the end of the last century, shortly after, Modeer and Bremser discovered in Sweden and Vienna that this *Strongylus* infected the bronchial tubes of domesticated swine. Rayer found the parasites, in the same anatomical situation, in a pig in the Paris Market in 1844; two years later Bellingham discovered the parasite in Ireland. For long, experts have admitted that *Strongylus paradoxus* infests the lungs of swine, causing an affection which was rare till recently. Dr. Cobbold, in 1879, and M. Chatin, in 1881, both showed that swine were becoming more subject to this worm. The former pointed out its danger when a large number of worms collected in the bronchi. In 1850 the wild boars preserved for the Royal hunt, near Berlin, were decimated by this *Strongylus*. M. Chatin notes that no report of the existence of this species in man can be found in medical literature, but the alleged new species, *Strongylus longevaginatus*, found investing the lungs of a child, aged six, at Klausenburg, Transylvania, in 1845, is evidently, in M. Chatin's opinion, identical with *Strongylus paradoxus*. Hence, in reality, the latter species has twice been found in man, and on the first occasion it infested the lung and caused death. The worm is very tenacious of life, and its embryo may remain in water, or completely dried up, for a year without undergoing any change; yet, if then swallowed by a pig in fodder or drink, it will rapidly develop and propagate. M. Chatin believes that in the case at Oloron the parasite was probably swallowed in drinking water. Since swine are becoming more and more subject to *Strongylus paradoxus*, he thinks that sanitarians must be watchful, lest man should become frequently subject to the ravages of a worm liable, from its favourite habitat, to cause more mischief than can be wrought by *Tænia, Oxyuris, Lumbricus*, or even the leech-like *Dochmius duodenalis*, which caused anæmia amongst the men employed in the St. Gothard Tunnel.

THE INTERNATIONAL CONGRESS ON TUBERCULOSIS.

THE meeting of the Congress to discuss the question of Tuberculosis, and which was announced in this Journal some months ago, took place at Paris on July 25th, and sat for a number of days. To a correspondent who was present we owe the following report of the interesting proceedings, the record of which begins on the 25th July. He writes:—

When it is considered that no disease has a more general distribution or claims more victims than does Consumption, one cannot but hail with satisfaction the meeting of the Congress of medical men and veterinary surgeons which assembles in Paris to-day to devote a week to the study of human and animal Tuberculosis. The Congress has been organised by a committee, of which Professor Chauveau, member of the Institute and Inspector-General of the French Veterinary Schools, is President, and Professor Villemin, member of the Academy of Medicine, Vice-President; the other officials being M. Butel, veterinary surgeon, etc.; M. Leblanc, veterinary surgeon and member of the Academy of Medicine; Professor Stocard, Director of the Alfort Veterinary School; M. Rossignol, veterinary surgeon; MM. Cornil, Grancher, Lannelongue, Verneuil, Professors to the Faculty of Medicine, Paris; and Dr. L. H. Petit, General Secretary. The list of subscribers to the Congress has just been published, and contains the names of about three hundred of the most eminent physicians and veterinarians of the European continent. It is surprising to find that in this long list the names of only three gentlemen from Great Britain—two physicians and one veterinarian—are to be found. It may be well to point out that this apparent apathy on the part of our countrymen is, unfortunately, not, as might be supposed, due to an absence, or even to a lesser prevalence, of the disease in Great Britain. It is to be hoped, however, that the public of this country, who have lately shown considerable interest in the subject, will follow with attention, and profit from, the deliberations of the Congress. Sixty-five communications have been announced by various well-known authorities, embracing the different aspects of the subject—such as modes of diffusion of the disease; its prophylaxy and treatment. Due prominence is given to the part of the subject of most interest to the public—viz., the dangers incurred by the use as food of the flesh and milk of tubercular animals, and other dangers attendant on the conservation in our midst of well-defined cases of Phthisis in cattle.

It is gratifying to observe, in the pages of the *Recueil de Médecine Véterinaire*, that the French Government are about to add Tuberculosis to the list of the diseases included in the Contagious Diseases (Animals) Act, and it is to be earnestly hoped that our Government may be induced, with the least possible delay, to adopt a like measure. The great difficulty—indeed, one may say the absolute impossibility—of diagnosing the disease in its early stages, and more particularly in those cases in which the *post-mortem* microscopic lesions are only detectable in the abdominal organs, has been the only consideration restraining the French Government hitherto from this most judicious action. It is more than probable that they have been influenced in their present action by two important considerations, viz.:—First, that in the stages or conditions of the disease in which its diagnosis is impossible, the chances of its dissemination by the living animal are at a minimum, if not altogether nil; and second, that when the animals have attained a condition favourable to the dissemination of the disease, the improved methods of examination have made the diagnosis in most cases easy, and in almost all possible.

For the present it will be sufficient to indicate, with respect to the Congress, that its sittings commence this morning at 9 o'clock in the small amphitheatre of the Faculty of Medicine by a meeting of members for confirmation of rules and appointment of office-bearers, etc.; at 3 p.m., the public meeting of inauguration in the large amphitheatre of the Faculty of Medicine; at 9 p.m., reception of members of the Congress by the Committee in the Council Hall of the Faculty of Medicine. The officials are desirous that it should be known to members of the medical and veterinary professions, who have not enrolled themselves, and who may still be desirous of doing so, that arrangements will be made on their arrival in Paris for their reception and participation in the proceedings of the Congress.

XUM

July 25th.—There assembled this morning the numerous adherents of this Congress, in the small amphitheatre of the *Faculté de Médecine*. After classifying the communications, so as to facilitate as much as possible the dispatch of the business of the Congress, the election of office-bearers was proceeded with, which resulted as follows:—M. le Dr. Chauveau, President; and MM. Villemin and Verneuil, Vice-Presidents. The questions to be discussed were the following:—I. The dangers which accrue from the use as food of the flesh and milk of tubercular animals. The means of preventing them. II. The respective aptitudes for the development of Tuberculosis of man, animals, and organic media. III. Modes of introduction and of propagation in the economy of the tubercular virus. Prophylactic measures. IV. Early diagnosis of Tuberculosis in man. IV. (bis.) Early diagnosis of Tuberculosis in animals.

At the afternoon meeting Dr. CHAUVEAU, on taking the chair, delivered a long and eloquent speech, of which the following is a synopsis:—Having alluded to the special importance of the subject the members of the Congress were assembled to discuss, he pointed out the vast distribution of Tuberculosis, dwelling upon the fact that no class was exempt from its ravages, nor any civilised country free from its effects. The countries formerly exempt were those into which Europeans had not penetrated, but in which the natives could now count amongst the blessings of civilisation the introduction of Consumption. He pointed out that this prodigious extension of Tuberculosis in itself merited all the interest inspired by the disease, but that a greater and more powerful motive demanded the attention and interest of the meeting in this subject, viz., that we now know the principal cause of the excessive multiplication of Tuberculosis, and were justified in the hope of being able to considerably limit its ravages. This hope was created in scientific minds when it was proved that the disease propagated itself by germs after the manner of virulent and contagious diseases. This great fact was a contemporaneous conquest of recent date, although the idea of contagion was by no means a new idea. The celebrated Morgagni was often cited for his faith in the virulence of Tuberculosis, and for his repugnance to the *post-mortem* examination of tubercular subjects. The popular instinct in southern countries had never ceased to believe in its transmission by contagion, by intimate contact with the consumptive, the use of their linen, or the clothes habitually worn by them. The medical world of our own day, however, was far from participating in these views. To it, Tuberculosis appeared to be a spontaneous creation in an organism, the victim of physiological misery, either hereditary or acquired under the influence of bad hygienic conditions, privations, usage, or disease. Faith in the contagion of Tuberculosis had entirely disappeared, and the old world had quietly settled into an opinion from which it did not seem likely to be disturbed, when suddenly the declaration was made—"Tuberculosis is contagious; it has its proper virus, and that virus is as certainly inoculable as the virus of no matter what disease, shown to be thoroughly virulent." The pathological world did not at once bow to the evidence of the demonstration which had been thus brought to its notice. After long and acrimonious discussion the scientific truth is established, and "who to-day would contest the virulence of Turberculosis?" Dr. Chauveau then paid a high tribute of respect to Professor Villemin, to whom the honour belongs of having first demonstrated the virulence of Tuberculosis. He spoke of the pleasure it had given him to be the first to bear witness to the value of the discovery. After tracing the different phases of the discussion raised in opposition to M. Villemin's experiments, in which the principal objection taken was to the unnatural manner by which the infection was produced (inoculation), he referred to his own experiments, giving proof of infection by a

natural mode (ingestion), and spoke of the pleasure it gave him to point out to the academic judges that they had neither properly appreciated nor properly rewarded M. Villemin for his work. These experiments on infection by ingestion were reported to the Academy of Medicine by Dr. Chauveau in 1868. It was shown by these experiments that the introduction of the virus by the natural channel produced the disease more rapidly and more completely than did its deposition into the subcutaneous connective tissue. It is now twenty years since the completion of these experiments. At that time Professor Chauveau was engaged in the solution of the problem of the physical conditions of virulent agents, as the result of which he succeeded in proving that the infectious properties did not reside in liquid or soluble substances, but in figured elements. These results he arrived at by the comparative inoculation of filtered and unfiltered tubercular humours. The demonstration of the corpuscular nature of the virus was in reality the first step in the actual discovery. When later the animated nature of the corpuscles was placed beyond doubt, their cultivation outside of the animal economy was attempted on the lines on which, by this time, the cultivation of the Anthrax organism had been found to succeed. M. Toussaint was the first to make known the positive result of the inoculation of his cultures, and Professor Chauveau having witnessed these experiments was able to testify to the success of his inoculations with cultivations at a considerable distance from the first generation. Toussaint, however, did not recognise the real agent of the tubercular virus, which honour was reserved for M. R. Koch. Having paid a high tribute to M. Koch for that and other pathological work, and having justified the name given to the organism, Koch's bacillus, on the ground that no one ought to be robbed of the honour of such a discovery, the President asked why the same honour should not have been shown to M. Davaine for his discovery of the Anthrax bacillus, which was really the starting point of the whole microbiological science? It would surely only be right to commemorate the event by conserving for it the name of Davaine's bacillus. The ravages of Tuberculosis are not confined to the human race, but also play the greatest havoc with the domesticated animals, more particularly with cattle, one of the species most intimately associated with the life of civilised people, and furnishing the greater part of our milk and meat supply. For long these dangers were ignored; it was not easy to get a recognition of the grave risks to which human lives were exposed. The prevalent idea was that the bovine and human diseases were distinct. At this time the differentiation of neoplastic diseases was for the most part based on pathological anatomy. The great authority of Virchow materially contributed in confirming the prevalent opinion. The exposure of the great German authority's error commenced with the experiments of Professor Villemin, but was ultimately definitively demonstrated by his countryman M. Koch in his discovery of the bacillus. It was, however, at the Lyons Veterinary School, where healthy young animals of the bovine species were fed with human tubercular matter (in which all became affected), that the identity of the disease was first demonstrated. After further illustrating the identity of the disease in man and animals, and dilating on the difficulties necessarily existing in the absolute determination of pathological problems relatively to the ease and certainty existing in the solution of the problems in mathematics, physics, and the other sciences, Professor Chauveau concluded with the hope that since the publication of the excellent works of M. Pasteur on the ferments, we may be permitted to hope that, as they have definitely introduced into pathology the part played by the infinitely little, the pathologist may one day be able to render his work as easy as that of the naturalist, as precise as that of the physician, and as fertile in rigorously deduced laws as that of the mathematician. Meantime we must be content with being useful

which is a noble end to assign to labour. That which has been devoted to Tuberculosis has been particularly fruitful. The experimental and comparative pathology work must continue. If it succeeds in formulating rules for the diminution of this terrible scourge, if it succeeds in augmenting the duration of life and happiness on earth, it will have rendered to the individual and to society a singularly good service. M. VERNEUIL then gave the members of the Congress a cordial welcome, and remarked that although this was certainly not the first time that doctors and veterinary surgeons had united in the collaboration of scientific work—mentioning the work of Bouley and Brouardel, and the Encyclopædia of Dechambre—it was, however, the first time they had met together *en masse* for the determination of a scientific question. Having inaugurated this new departure, it was to be hoped that the question of Tuberculosis would soon be determined, and that, continuing in this good path, they would continue to meet for the solution of important questions in connection with other diseases, such as Diphtheria, Septicæmia, Parasitism, Tetanus, etc. He then proceeded to give details on the origin of the Congress, from which it appeared that it was due to the solicitations of a country practitioner in veterinary surgery, M. Butel, of Meaux, who first entertained the idea of a reunion of the professors and practitioners of both professions for the study of the disease. He terminated his discourse in words of which the following is an almost literal translation :—"Sirs, if I mistake not, the present is a day of good augury, and of which you will retain a pleasant remembrance, for to-day in France, at Paris, this modern Babylon, we loudly proclaim the unity of the medical science, we further proclaim the equality of those who cultivate it, and we show the fraternity which exists among all its representatives."

Professor CORNIL then made a most interesting communication on the contagion of Tuberculosis by the mucous membranes, and detailed his experiments on guinea pigs, animals which present the greatest susceptibility to the disease. From them it would appear that, after the placing in the pharynx of a single drop of the liquid culture of the "bacillus Tuberculosis," naked eye lesions were found extending along the whole alimentary tract on the animal being killed fifteen days later. M. NOCARD next read his interesting communication on the dangers arising from the use of the milk and flesh of tubercular animals, and detailed the measures which the Government were about to put in force for the public's protection. These the meeting received with signs of dissatisfaction.

July 26th.—The discussion on Professor Nocard's communication was opened this morning by Professor ARLOING, Director of the Lyons Veterinary School. The point of particular interest was the manner in which he dealt with the experiments which M. Nocard had made and brought forward in support of his advocacy of the partial condemnation of animals in which the lesions appeared to indicate localised tubercle. He showed that experiments with the expressed muscle juice of only a limited part of a carcase could not be accepted, in the event of their failure to communicate the disease, as demonstrative that the whole carcase was sound. If, he said, the experiments of others operating in exactly the same conditions were taken into account, it would be found that they had succeeded in communicating Tuberculosis to the guinea pig in a much larger proportion. Thus, if Professor Nocard's experiments were added to the others, it would still be found that the percentage of cases in which the inoculations succeeded was very considerable. Nothing was more common than to find people eating meat from which blood could be expressed, and it was perfectly well known that the temperature in cooking could not have reached in the bleeding portion of such meat 60 degs. C., which temperature was totally insufficient for the destruction of the infectious agent. It was, therefore, a matter of necessity, in the interest of the public

health, that tubercular animals should be totally rejected. M. Arloing further insisted on the necessity of veterinary inspection of slaughter-houses in the smaller as well as in the larger towns. It was necessary that all animal food should be inspected, for animals of a suspicious kind would always be sent to those places in which there was either no inspection at all or where it was carried out with least rigour. Dr. BANG, of Copenhagen, spoke in the same direction as Professor Arloing, and added a most interesting communication on the infective properties of the milk of consumptive women and of tubercular cattle. He showed that for the destruction of the bacillus even in the liquid medium (milk) it was necessary to submit it to a temperature of 75 degrees Centigrade, and that for not less than five minutes. M. BAILLET, veterinary surgeon, Inspector of Meat at Bordeaux, was of opinion that meat as an agent of transmission of the disease played a very minor part, and that too severe measures were prejudicial to agricultural and commercial interests, and approved only of the condemnation of cases in which there was generalisation of the disease. M. BUTEL, the promoter of the Congress, strongly condemned the opinion and action of M. Baillet, and insisted that the interests of commerce and agriculture were of less importance than the welfare of the general public. He believed, however, that proper sanitary measures could not be universally adopted without money, an indispensable condition being to provide compensation for the persons whose animals were seized. As to the milk, M. Butel agreed with the opinion already advanced, that there should be a special veterinary supervision of dairies, inspection of the milk of suspected animals, and their slaughter and destruction (chemically) on the suspicion being confirmed. Animals under suspicion should meantime be separated.

At the afternoon meeting the discussion was continued, when the President called upon Mr. ARCHIBALD ROBINSON, of Greenock, who said that it had not been his intention to take part in the discussion, but that, as the members of Congress would probably be asked to vote on the question of partial or total condemnation, he desired permission to say a few words. He should commence by telling them the practice that had been followed in the town from which he had come to take part in their brilliant discussions. Since 1865 his father had been in the habit of condemning all tubercular animals, except those in which the disease existed to the most limited extent, and in these he rejected the internal organs and viscera. He had himself had the privilege of witnessing the experiments of Professor Saint-Cyr at the Veterinary School of Lyons in 1873 and 1874, and on his return to Scotland in the latter year, had made representations to the municipality, with the result that all animals, no matter how slightly affected, were condemned absolutely. From careful examinations during the last fourteen years, he considered himself justified in affirming that in his part of the country at least localised tubercle, if such could indeed be pathologically considered to exist, was altogether exceptional. In cases where the lesions appeared internally to be confined to the mesenteric glands he had found the external iliac glands affected, and in cases in which the lung lesions did not present the appearance of long duration, he had frequently found the prescapular lymphatic glands invaded. Nothing had more surprised him than to hear the Inspector of Meat for Paris declare that veterinary surgeons in their official capacity should not have definite opinions, but should act according to distinct regulations laid down to them. In the absence of these definite regulations, it was his (Mr. Robinson's) opinion that no one was more qualified to form an opinion than veterinary surgeons, whose duty it was to have very definite opinions and to exercise these opinions so as to cause them to prevail with the municipality for which they acted. In view of the action which would probably be shortly taken in England, he urged on the Congress, if a vote was taken, not to take a step so retrograde as to countenance

XUM

partial condemnation. He could assure the Congress that if he had thought that there was the most remote chance of such half measures being adopted he would not have travelled so many miles to be a party to them. Far better that a hundred carcases should be lost than that a single human being should be infected with Tuberculosis, particularly considering the ulterior consequences to his family and other persons with whom he might come into intimate contact. As the public were the individuals to benefit from these condemnations, he considered that the expense of compensation should be met by universal taxation. Mr. Robinson's remarks evidently met with approval on the part of almost all the members of Congress; and after a number of others had given expression to similar views, the following resolution was carried, three members only dissenting:—

"Science having demonstrated that Tuberculosis can be transmitted from animals to man by the ingestion of meat, it is necessary to adopt total seizure of the flesh of infected animals, and to compensate the proprietors of the meat seized."

M. PEUCH, Professor at the Toulouse Veterinary School, gave an account of a number of interesting experiments which he had undertaken with meat and milk of tubercular animals, and enlarged on the legislative measures necessary to deal effectually with the disease. M. SOLLES gave the details of experiments he had made with tubercular matter from the human lung, which showed that the animals (rabbits) inoculated succumbed, some to Erysipelas, some to Septicæmia, and some to Tuberculosis. From these experiments he concluded that human Phthisis was frequently a multiple infection, and could, on transmission, assume a variety of forms. M. BOULANT gave a statistical table of Tuberculosis in the different districts of Limoges; and MM. KALINDERO and CHAMBERLENT treated the subject of tubercular meningitis, the first in the adult, and the second in women during pregnancy, after which the proceedings terminated.

On the morning of July 27th, a large number of the members met in the laboratories of MM. Strauss and Cornil for the anatomical and bacteriological study of the lesions of Tuberculosis. M. Cornil submitted the progressive lesions to the microscopic examination of the visitors, and answered all the interrogations with the greatest patience and amiability. M. Strauss exhibited a number of fowls which had for varying periods been fed on tubercular expectorations, and while admitting that cases of fowl infection were not rare, showed that, experimentally, fowls frequently exhibited an absolute immunity from infection by ingestion. This he confirmed by killing two of the fowls, and making a *post-mortem* examination of them in presence of the members. One of these fowls had been fed for over a year on tubercular expectorations, and the other for ten months. The first, he computed, must have swallowed over a hundred pounds weight of tubercular matter, the infectiousness of which had been from time to time proved by the infection of guinea pigs both by inoculation and ingestion. These fowls presented all the appearances of health, and were in capital condition. Their *post-mortem* confirmed the outward appearances. Notwithstanding the most minute examination of almost all the members present, not a single tubercular lesion was to be found. The Museum of Hygiene was next visited, where Professor Proust and Dr. A. J. Martin demonstrated the advantages of the more recent systems of ventilation and drainage of private houses and public buildings. Professor Proust, for the benefit of the members, had specially collected in the Museum a complete series of utensils for the disinfection of the expectorations of phthisical patients, their garments, the vessels and, indeed, everything which they used or came in contact with, and also appliances for fumigating and disinfecting the rooms. A special apparatus driven by the hand, and projecting a carbolised or other disinfectant spray,

was exhibited as that adopted at the Parisian hospitals for disinfection of the walls. This series of appliances, which for the present are to be found only in Paris, awakened the liveliest interest on the part of the visitors, who seemed thoroughly gratified with the instruction they had received in the laboratories of MM. Strauss and Cornil, and in the Museum. The visit to the latter had been rendered most instructive by Professor Proust's illustrations and explanations of the application of the sanitary appliances.

At the meeting in the afternoon, the President read a letter received from, and signed by, the committee of the members of a Commission formed in Sweden for the study of Tuberculosis. This letter set forth that the Commission was appointed at the Congress of Swedish doctors of 1887, and that the Paris Congress would learn with pleasure that the questions which were the object of its studies were equally the objects of study in Sweden. The Commission had issued a list of questions to all the doctors in the country, requiring information as to the age, the profession, and the domicile of all their patients suffering from any form of Tuberculosis, and indicating as far as possible the cause in each case (heredity, contagion, from man to man, by milk or by flesh), and if the Tuberculosis had been preceded by Scrofula. The veterinary surgeons had also received a list of questions on the subject of Tuberculosis in cows, its causes, if it had been found affecting the teats; and if they met with Tuberculosis in pigs, etc. The Commission hoped that these documents would indicate what could be done to combat Tuberculosis. In distributing among the doctors special scientific works, the Commission hoped to induce them to closely study the disease, and desired further, by popular writings which were in contemplation, to draw public attention to the nature of Tuberculosis, and the dangers to which it exposed individuals and society. The Commission felicitated the Congress on having made this important question the object of its studies, which it would follow with the greatest interest.

Dr. DE BRUN, Professor at the Faculty of Medicine at Beyrout (Syria), referred in his paper to the antagonism which seemed to exist between malarial infection and Tuberculosis. The natives of that country, he said, are almost exempt from Tuberculosis; on the other hand, tubercular subjects, whether sent for their health on account of the mildness of the climate, or contracting the disease after their arrival in the country, develop the disease with a rapidity of evolution quite unknown in France. The importation of the disease to Syria coincides with the augmentation of the population and the draining of the country, and it may be affirmed that Tuberculosis only made its appearance on the disappearance of malaria. Persons in comfortable circumstances, and least exposed to malaria, are those in whom Tuberculosis is mostly seen.

M. PIOT, veterinary surgeon at Cairo, had made similar observations in Egypt to those of M. de Brun in Syria. The negroes living in the south are most subject to Tuberculosis. In animals, Tuberculosis is rarely met with, but in the cases which do occur the evolution of the disease is of an extreme rapidity.

Dr. REDARD related the success he had had in cases of tubercular disease of the articulations in children, by incision with the thermo-cautery, scraping, drainage, antiseptic resection, and antiseptic baths. He insisted that in children recovery could always be effected by these means.

M. VERNEUIL supported the remarks of Dr. Redard, whose opinions were those which he himself had long maintained. He advocated conservative principles in dealing with the tubercular articulations of children, insisting particularly on sterilisation of the pathological centre before bringing the knife into operation. For after treatment, antiseptics and immobilisation were usually sufficient to induce recovery. He desired particularly, however,

XUM

to impress upon his audience that these happy results could not be anticipated in adults.

MM. CHANTEMESSE and VIDAL communicated a series of interesting experiments, showing the length of time the bacillus Tuberculosis and its spores retained vitality in water taken from the Seine, the result being that in water previously sterilised, and maintained at a temperature of from 8 to 12 degs. C., they continued alive for fifty days. In water similarly dealt with, but kept at repose, they were still alive at the end of seventy days.

M. ARLOING stated that MM. Galtier and Cadiac, of Lyons, had made experiments with the same object. M. Galtier placed tubercular fragments in running water in which the temperature varied from 15 degs. to 6 degs. C. With this treatment the tubercular fragment had conserved all its virulence at the end of fifteen days. M. Cadiac found that in running water virulence was conserved for a month and a half, and that in water at repose virulence was proved by successful inoculation after 120 days' submersion. An inoculation 123 days after submersion gave a negative result. M. Arloing, in speaking of the means capable of preventing the extension of the disease, said, reflecting on the results obtained from extirpation of the chancres and neighbouring lymphatic ganglia in Syphilis, he endeavoured by similar means to arrest the development of Tuberculosis. When the guinea pig is inoculated with tubercular virus, it invades step by step the ganglia from a peripheral inoculation towards the centre. Thus, if a guinea pig be inoculated in the thigh, the ganglia of the groin are next affected, then the sublumbar, then the ganglia of the thorax, until at last generalisation takes place, with infection of the lungs and other organs. After inoculating several guinea pigs in the subcutaneous tissue of the thigh, he daily examined the animals to determine the exact moment at which the ganglia became affected. Finding that on the seventh day there was still no enlargement, he excised the ganglia, and the glandular tissue which accompanies them in these animals, in two of the subjects. The ganglia appeared quite healthy. Finding slight enlargement on the fifteenth day in three of the subjects, he excised the enlarged ganglia. He reserved two subjects as test animals. Two and a half months later he made a *post-mortem* examination of the seven guinea pigs under experiment. In all, the first as well as the last, the viscera were filled with tubercular nodules. Thus, notwithstanding the preventive eradication of the ganglia, generalisation of the disease had taken place in all the animals alike. He inoculated two other animals with tubercular products from a human lung; then five days later he removed the ganglia of one of the animals; these ganglia appeared healthy except one, in the centre of which there was a small red spot. Two months and a half later the *post-mortem* revealed tubercular generalisation. The excision of the glands had not in the slightest degree arrested the evolution of the disease. M. Arloing then proceeded to consider whether immunity might not be acquired from inoculation, and reminded his audience that for a moment it had been anticipated that scrofular products might furnish the desired attenuation. He had, however, practised the inoculation of scrofulous material to the guinea pig; then, as soon as the scrofulous condition had been induced, he inoculated tubercular material. The evolution of the tubercular process was of an astonishing rapidity, and was in no way arrested by the primary injection of the scrofular material. Without being able to hope that preventive inoculation of an attenuated material would ever be found to endow the animal with immunity, might we not, he asked, be permitted to hope by impregnating the system with another modified virus, as M. de Brun had shown in the case of malaria, to be able to endow the system with immunity? Typhoid Fever having been regarded as antagonistic to Tuberculosis, he had commenced experiments in that direction. As the guinea pig showed a wonderful

resistance to typhoid inoculation, he endeavoured to produce a typhoid impregnation of the system by hypodermic inoculation for six days of typhoid products. On the eighth day he inoculated eight guinea pigs, and other two non-impregnated animals as proof subjects. This was done on the 29th of June last. The *post-mortem* of these animals was made on the 25th of July. All the animals were tuberculous, and he had just learnt from his assistant that those which had undergone the typhoid inoculations were affected in a more intense degree than the proof animals. Notwithstanding this failure, it was necessary to continue these experiments, for it would not be astonishing for them one day to discover a virus which by its presence in the organism would give immunity from Tuberculosis. It was only necessary to recollect that MM. Raymond and Arthaud had rendered tuberculisation less easy by previous impregnation of the system with tannic acid.

M. B. ABES then read a long and interesting paper to show that human Tuberculosis was, in the majority of cases, accompanied during its evolution by other micro-organisms besides the bacillus Tuberculosis.

M. DURET (Lille) next detailed his treatment of the different forms of tubercular alteration of the ganglia, which he distinguished clinically under three heads—1st, fibro-caseous; 2nd, simple caseo-tubercular; 3rd, caseo-tubercular, with suppuration fistulæ, etc. In the first, he practised simple excision; in the second, he had good results from pyro-puncturing and emptying the glands; in the last he had also derived benefit from destruction of the vegetations, ulcerations, and fistulæ by the actual cautery. With this treatment he found that the cicatrices observed as the result of abrasion were avoided.

MM. CORNIL and TORPET exposed a case that had come under their observation, in which the introduction under the skin of the most minute fragments of stone had determined a pseudo-Tuberculosis, in which the pathological alterations closely resembled Tuberculosis, and demonstrated that in certain cases a definite opinion could not be given in the absence of the bacillus, or, failing that, it would be necessary to test by experimental inoculation. M. CORNIL also referred to a case of pseudo-Tuberculosis in an antelope, which appeared to depend upon the presence of a bacillus of an ovoid form. The pathological alterations were much the same, and it was hardly possible to differentiate between the diseases in the absence of microscopic investigation.

M. HURCAN strongly condemned the treatment of physicians who recommended phthisical patients to a diet consisting of raw beef and blood.

M. ARLOING said that where doctors considered blood or raw meat should be used they ought to insist on their patients being restricted to the blood and flesh of sheep and goats. As a matter of experiment, he had drunk sheep's blood. If one had his eyes shut, or drank from an opaque glass, he could not tell the difference between it and warm milk, and no disgust was experienced. For the clarification of wine the blood of the sheep or the goat only should be used.

July 28th.—At to-day's meeting, M. ROBINSON, Constantinople, said he was attached to the hospital there, and in a total of 400 patients, from the 1st October, 1885, to the first October, 1887, forty were phthisical patients; consequently, Tuberculosis was not so rare in Asia Minor as had been supposed. In certain parts of Cappadocia, Tuberculosis was pretty common, and in several villages was remarkable for its hereditary transmission in certain families. In the mountainous districts around Sauras, Tuberculosis attacked the population in the proportion of one in fifty, notwithstanding the fact that they were shepherds, living in the open air, and whose nourishment consisted of milk and wheat and rye bread. These conditions might be considered highly unfavourable to the production of the disease. The explanation, he thought, however, was to be found in the fact that they sold

the best of their cattle, and killed and ate the poor and diseased animals themselves. He concluded that the prevalence of Tuberculosis in people so situated must depend on the ingestion of tuberculous milk and meat.

M. SOLLES, of Bordeaux, gave an exhaustive report of a number of experiments he had conducted on guinea pigs, demonstrating the heredity of the disease. These experiments proved that in guinea pigs, as in man, the inherited Tuberculosis did not develop in infantile life, but manifested itself at a somewhat later period; and, further, that experimental Tuberculosis had a very much more rapid evolution than hereditary Tuberculosis.

M. HANOT spoke of tubercular chirrosis, and quoted a number of observations calculated to establish that atrophic chirrosis was frequently the result of the bacillus Tuberculosis in the absence of alcoholism or any other accessory cause.

M. ARLOING exposed the experiments of M. Galtier on the heredity of Tuberculosis, from which it might be concluded that uterine infection was far from being as common as was supposed. He had, however, in the course of his own experiments met with a case in which uterine infection had taken place. Two inoculated female guinea pigs gave birth ten days later to several young, of which one died prematurely. Two others lived three months, and presented some caseous masses under the skin. As no other means of entrance of the bacillus existed, this was necessarily a case of uterine transmission of Scrofula. Other papers were read by M. Ricochon, M. Ferrand, and M. Maluz, on heredity.

M. CAGNEY, of Senlis, made an interesting communication of a recent observation he had made on an outbreak of Tuberculosis in a poultry yard. The lady who owned the poultry died of Phthisis, and her son had just returned, much improved in health, from the South of France. It appeared that this youth had been in the habit of amusing himself by coughing and spitting for the delectation of the fowls, who immediately surrounded him and fought over his expectorations, which they rapidly devoured. M. Cagney had the fowls destroyed and the poultry yard thoroughly cleansed and disinfected, and so far no further case had occurred.

M. JANESCO (of Paris) related a case of rheumatic arthritis, complicated with Tuberculosis, which obtained its interest from the extreme rarity of the complication.

M. VERNEUIL, in a few remarks on M. Janesco's paper, said that, notwithstanding the rarity of these cases, he had some years ago pointed out that this form of morbid *hybridity*, when met with, was found to depend upon the presence of the diseases in the parents—the one being subject to the rheumatic diatheses, and the other to Consumption.

At the afternoon meeting a number of physicians read communications on the treatment pursued by them in cases of Tuberculosis, which consisted principally in surgical interference in glandular affections and the use of local and general antiseptics.

M. ARLOING referred to the experiments already published with regard to inoculation of animals as an element of diagnosis in cases of Tuberculosis in man. He wished, however, to add, as the result of his experiments, that the rabbit, contrary to general opinion, was not a favourable subject for the development of Tuberculosis. If ten rabbits and ten guinea pigs were simultaneously inoculated, some of the rabbits would prove refractory, while all the guinea pigs would become affected.

M. NOCARD confirmed the opinions advanced by M. Arloing. M. SOLLES had also observed the facts presented by M. Arloing.

M. THIERY supported some observations by M. Bang, with regard to the transmission of Tuberculosis to calves in districts where they were reared for veal. In an epizoötic outbreak which he had observed in calves he had

discovered in several instances that one cow in an establishment had been sufficient to cause all the trouble, this cow's milk being mixed in one receptacle with all the rest.

July 29th.—To-day over two hundred members of the Congress visited the Alfort Veterinary School, where they were received by M. Nocard, the affable director of that magnificent institution. After having made a general survey of the institution, the members assembled in one of the amphitheatres, where M. Nocard exhibited a number of specimens and drawings of the lesions of Tuberculosis in various different animals. A number of animals suffering from Tuberculosis were afterwards inspected alive by the members. The animals were then killed, and *post-mortem* examinations made in the presence of the visitors. A number of students rapidly mounted specimens of the bacillus, and submitted them to the microscopic examination of the members. Among the animals thus dealt with were a sheep and a guinea-pig which had been inoculated with a pseudo-Tuberculosis.

July 30th.—M. DE TOMA to-day communicated an interesting paper on the modes of distribution in the system of the bacillus, showing that there was first infiltration of the tissues surrounding the point of inoculation, from which the bacillus was carried by the lymphatics to distant organs. MM. STRAUSS and WURTZ made a communication on the influence of the gastric juice on the bacillus Tuberculosis. From a number of carefully-performed experiments which they had made it appeared that the gastric juice is capable of killing the bacillus Tuberculosis in six hours, but that the bacillus still conserves its virulence for over five hours. M. PETRESCO said that, as contagion was spread principally by expectorations, it was not sufficient to disinfect them after emission. It was preferable to deprive them of their infectious properties beforehand, and consequently he had devised a very easily carried inhalator, from which the patient could inhale all day without any inconvenience, the apparatus being carried in the breast pocket. M. Leloir, M. Jeauselnic, and M. Jacobi (of New York) continued the discussion. At the evening meeting M. BUTEL supported the opinion that the infection of Tuberculosis was much more frequently the result of ingestion than of respiration. Several other members spoke in support of M. Butel's contention. The remaining time of the meeting was principally occupied by a communication on the surgical treatment of tubercular complications.

July 31st.—After the reading of a great number of papers, dealing principally with the treatment of Tuberculosis, some discussion took place on the prophylactic measures which should be recommended to the State. The PRESIDENT, however, pointed out to the members that our recommendations in the meantime could only take the form of an expression on the general basis of desirable legislation, and intimated that the committee had classed the propositions emitted by certain members as follows:—

I.—"There ought to be placed in the attributions of the hygienic councils all the questions relating to the contagious diseases of the domesticated animals, comprising all such diseases which do not at present seem transmissible to man. To Vaccinia, Glanders, Rabies, Anthrax, Tuberculosis there might indeed be added later other common infectious diseases requiring equally a common protection." Unanimously adopted.

II.—Every possible means should be adopted, comprising compensation to parties interested, for the general application of the principle of seizure and general destruction in totality of all flesh belonging to tuberculous animals, no matter how slight the specific lesions found in such animals.

III.—Printed simple instructions should be distributed in the towns and throughout the country indicating the means necessary for the protection of the people from the dangers of tubercular infection from food, particularly from milk, and how to destroy the germs contained in the expectorations of

the phthisical. M. GUINARD proposed to extend these instructions to linen, clothes, and objects used by the tubercular subjects. The proposition, thus amended, was unanimously adopted.

IV.—It is necessary to submit dairies to a special surveillance, so that it may be ascertained that the cows are not affected with contagious disease capable of communication to man. (Unanimously adopted.) Mr. Robinson, of Greenock, communicated to the members the recommendation of the Commission in England on the subject of Tuberculosis. Dr. Petit announced that a charitable work had been founded, entitled "Œuvres des Candidats à la Tuberculose," for the purpose of gathering children of poor phthisical parents, so as to rear them under the best hygienic conditions until they arrived at adult age. Two hospitals had been founded, one at Ormesson, near Paris, and the other at Valescene, on the borders of the Mediterranean.

The next Congress was fixed to meet two years hence. M. Villemin was voted President for the next Congress amidst deafening applause. After the usual votes of thanks the session closed.

CONTAGIOUS PLEURO-PNEUMONIA AND TUBERCULOSIS.

THE report of the Departmental Committee appointed by the Privy Council to inquire into Bovine Contagious Pleuro-pneumonia and Tuberculosis in the United Kingdom, was recently presented to both Houses of Parliament, and was circulated amongst the members. The committee consisted of the following:—Mr. Jacob Wilson (chairman), Sir G. Macpherson Grant, Bart., Mr. J. Bowen-Jones, Mr. P. Stirling, Professor Horsley, Professor Brown, C.B., Lord Cloncurry, with Mr. R. Dawson, secretary.

It embodies a very exhaustive inquiry, a great number of witnesses—veterinary and others—having been examined, and their evidence has enabled the committee to draw up the following summary of recommendations addressed to the Lords of the Privy Council.

With regard to the first-mentioned disease, they state:

It now remains for us to lay before your lordships a summary of the recommendations on the subject of Pleuro-pneumonia which we have to offer, and which are based upon the considerations above detailed.

That the system of compulsory slaughter be applied not only to all diseased cattle, but also to all cattle which have been in association with them, or otherwise in any manner exposed to the infection of disease.

Compulsory slaughter should be accompanied by supplementary measures, such as restrictions on the movement and sale of cattle within, or coming from, infected districts.

Any exception to, or modification of, the system of compulsory slaughter, as provided in the Slaughter Order, 1888, should only be applicable to cattle in the dairy yards, byres, and cowsheds of large towns, the owners or occupiers of which may claim in writing the privilege of exemption for their cattle from immediate slaughter on the following conditions:—

(1) No head of cattle that has been brought into such dairy premises shall be removed therefrom, except for the purpose of immediate slaughter.

(2) In the event of an outbreak of Pleuro-pneumonia, all the diseased cattle shall be slaughtered.

(3) All the remaining cattle on such premises where an outbreak has occurred shall be branded, and regularly subjected to the thermometer test; and whenever a continuous increase of temperature, rising above 104 degrees, is shown, they shall be slaughtered.

(4) No fresh cattle shall be admitted into such premises while any of the cattle thus branded remain alive.

Inoculation, for the reasons already detailed, cannot be recommended as a

means of eradicating Pleuro-pneumonia, nor as practicable under existing conditions. Although it is open to owners to inoculate their cattle, it should be distinctly understood that that operation shall not give them any immunity from the regulations above suggested.

The scale of compensation for animals slaughtered compulsorily should remain as at present. In the case of dairy cows, however, compensation should be awarded upon the basis of their value for dairy purposes, and not of their value to the butcher.

We recommend that, in order to put a stop to the frequent concealment of disease, a more stringent scale of penalties be put in force.

(1) That, for the first offence, the penalty should not be less than one-quarter of the present maximum penalty.

(2) For the second offence not less than one-half.

(3) For the third offence not less than three-quarters.

(4) The full penalty for any further offence.

The above to be irrespective of anything contained in the Summary Jurisdiction (Scotland) Act, 1881.

The administration of the Contagious Diseases (Animals) Acts throughout the United Kingdom, so far as they refer to compulsory slaughter and to the treatment and control of animals in herds or on premises where an outbreak of Pleuro-pneumonia has occurred, or in the surrounding area, shall be subject to, and under the direction of a central authority.

Local authorities shall continue to exercise all the powers that they at present possess, subject to the foregoing transfer of control to the central authority in the case of an outbreak of disease.

In all cases of compulsory slaughter, compensation should be provided from a national fund, whether drawn from the Consolidated Fund, or from a national rate specially levied for this purpose. All other charges—such as for inspection, disinfection, etc.—should be defrayed from a local rate, as at present.

It is highly desirable that the system of appointing veterinary inspectors by local authorities should be amended. Under each local authority there should be one responsible inspector, and care should be taken to secure the services of duly qualified and experienced veterinary surgeons.

Throughout the United Kingdom district inspectors should be appointed by the central authority, under whose direction they shall be, and to whom only they shall be responsible. Whether this system be adopted for the whole of the country or not it is, in our opinion, highly desirable that it should be at once put into operation in those districts which we have already indicated as specially infected with disease.

A more rigorous and careful inspection of town dairies and cowsheds is most urgently needed. We consider that every encouragement should be given to the removal of such establishments from crowded centres of population, and we would suggest the advisability, where possible, of suitable buildings being erected by corporations or other authorities, and let out to dairymen and cow-keepers.

A special system of inspection, and further restrictions upon the movement of dairy cows, should be immediately established in the Dublin districts.

Wherever practicable, local authorities should be called upon to erect public abattoirs as a substitute for private slaughter-houses.

Believing, as we do, that it is only by uniformity of action that we can hope to contend successfully with Pleuro-pneumonia, we desire to express our firm conviction of the desirability of vesting the administration of the Contagious Diseases (Animals) Acts in a single Governmental department, which should be sufficiently representative of the United Kingdom of Great Britain and Ireland.

In the event of its being deemed advisable to conduct an experimental inquiry into the nature of Pleuro-pneumonia and its preventive treatment by inoculation, we recommend that such inquiry should only be carried out under the following stringent regulations:—

(1) By a board of experts duly appointed by the Government, and on premises specially set apart and licensed for that purpose.

(2) No cattle entering such premises should ever be permitted to leave them except for the purpose of immediate slaughter, and under charge of an officer, who shall see that the slaughter is duly carried out.

With regard to Tuberculosis, the Committee remark: The great discovery that the tubercles or foci of the disease contained a virus or poison capable of inducing the disease when inoculated into the lower animals was first made by Klencke in 1843, but first described at length and placed on an undeniably firm basis by Villemin in 1865. The nature of the poison itself remained unknown, until it was discovered by Koch, in 1881, to be a rod-shaped microbe. The spores or seeds of the microbe have greater vitality than the adult rod. The temperature most favourable to the growth of the microbe is that of the ordinary heat of the animal body—from about 98·5° to 100·5° Fahrenheit. Growth ceases at 82° F., but the bacillus is not killed by cold. Kept at a temperature of about 107·5° F. for several weeks the organism becomes exhausted and dies.

It is abundantly evident that the infectious discharges of a tubercular subject remain actively virulent in this climate for a long time after they have been cast from the body, and that stalls and sheds may thus become a source of danger unless thoroughly cleansed. It appears that the organism grows most readily in omnivorous and herbivorous animals—carnivora being very rarely affected.

Certain unhealthy conditions cause a predisposition to contract the disease. Such are—starvation, bad ventilation, exhausting secretions, *e.g.*, prolonged lactation, heredity.

Modes in which the Virus or Microbe enters the Body.

The bacillus has been proved to enter the body and cause disease by inhalation, swallowing, direct introduction through a cut or sore in the skin or mucous membrane, and possibly intra-uterine.

Mode of Attack.

The disease may attack the body of an animal in two different ways. It may be introduced into the blood and distributed generally, so setting up the condition known as *acute* or *general* or *miliary Tuberculosis*. It may affect for a considerable time only the point of entry and the neighbouring lymphatic glands—*local Tuberculosis*.

Distribution of the Disease within the Body.

This is difficult to connect with any special mode of introduction of the virus, save perhaps inhalation. In cattle the lungs and pleura, and the serous membranes generally, are the favourite seats of the disease. In pigs it commonly attacks the glands in the neck. In rodents the spleen, the liver, the lungs, and the bones. In fowls the nose, mouth, and the spleen. In horses the glands, and in man the glands, lungs, joints, and the nervous system.

The distribution of the disease and the bacilli in the body closely affects the question of the use of tubercular meat as food. The marrow of the bones is affected at an early period, and, although rarely, the flesh may be.

The secretions from diseased organs contain the bacilli, and are consequently infective in proportion to the activity of the malady. It is obvious that the fact of milk being infected is of primary importance to the health of both animals and men.

FREQUENCY OF OCCURRENCE AMONG ANIMALS AND MEN.

It has been calculated that to this poison alone are due from ten to fourteen per cent. of all deaths among human beings.

The proportion among animals has not been so clearly made out. It is much more common among milking cows than other kinds of stock, and it is found that the lowest percentages occur in herds fed in the open air most of the year, the higher death-rates being among dairy cattle inhabiting sheds.

The relative frequency with which the disease appears among fowls seems to be not generally known, except to veterinary surgeons of large cities. Both from direct experiment and from clinical observation, it is now proved not only that the fowl may contract the disease from man by reason of its swallowing the expectorated bacilli, but that it thereby forms a vehicle for the further transmission of the disease to man and the lower animals.

REMEDIAL MEASURES.

Legislation directed to the protection of cattle from Tuberculosis should at the same time include such measures as will also prevent its communication to man, and must follow the two lines of prevention and extirpation.

PREVENTIVE MEASURES

should include—Improved hygiene of cattle sheds, isolation of suspected animals, precautions against the flesh or milk of diseased animals being given to others as food—*e.g.*, to pigs, fowls, etc. Care that fodder, litter, and water should not be taken from diseased to healthy animals.

Obviously, diseased animals, sometimes even in the last stage of the malady, are sold in open market; we are therefore very strongly of opinion that power should be given to the veterinary inspector to seize all such animals in fairs, markets, or in transit.

Since all authorities are agreed that the disease is very marked by heredity, we think it highly desirable that breeders should, in their own as well as in the public interest, discontinue breeding from tuberculous stock.

EXTIRPATION.

In order to ensure the general extirpation of Tuberculosis, we are of opinion that it should be included in the Contagious Diseases (Animals Acts, so as to provide

(1) For the slaughter of diseased animals when found on the owner's premises.

(2) For the payment of compensation for the slaughter of such animals.

(3) For the seizure and slaughter of diseased animals exposed in fairs, markets, etc., and during transit.

(4) For the seizure and slaughter of diseased foreign animals at the place of landing in this country.

Notification of this disease should not be compulsory, because it may exist without developing any sufficient outward evidence to enable the owner to detect it, and its growth is so slow that non-notification of its existence, even in a large number of cases, would do little to nullify the stamping-out effect of the Act of 1878.

The owner should be compensated for the slaughter of a tuberculous animal at the rate of three-fourths of its value before it was slaughtered, and the valuer should shape his estimate according to its worth to the owner—*i.e.*, as a milk-producer, or for any other special purpose.

If the animal should be one of great value, as in the case of pedigree stock, its worth might be determined by arbitration.

Professor Horsley adds a Supplementary Report, in which he suggests "that wittingly breeding from tuberculous animals should be made an indictable offence," and that "the compulsory notification of the disease should be included in any legislation for Tuberculosis."

Reviews.

THE MANAGEMENT AND DISEASES OF THE DOG. By J. WOODROFFE HILL, F.R.C.V.S. Third Edition. (London: Swan Sonnenschein and Co. 1888.)

The third edition of Mr. Hill's excellent work on the management and diseases of the dog marks an improvement on the second edition in some particulars, and renders it still more useful to those for whom it was written. Its success is the best criterion of its value, and dispenses with further eulogium from us.

A TREATISE ON THE DISEASES OF THE OX. Second Edition. By J. H. STEEL, M.R.C.V.S. (London: Longmans, Green and Co. 1887.)

We can only repeat what we have said above, with regard to the second edition of Mr. Steel's treatise on the ox. The work has received careful overhauling, and is fully brought up to the present time in its pathology.

We may assuredly repeat what we stated with regard to the first edition, and recommend the present one as heartily as we did it.

Army Veterinary Department.

We are very gratified in publishing the following announcement which appeared in the *London Gazette* of August 21st:—

Whitehall, Aug. 20th.

The Queen has been pleased to give and grant unto John Robert Beech, Esq., C.M.G., Veterinary Surgeon attached to the Egyptian Army, Her Majesty's Royal licence and authority that he may accept and wear the Insignia of the Order of the Medjidieh of the Fourth Class, which His Highness the Khedive of Egypt, authorised by His Imperial Majesty the Sultan, has been pleased to confer upon him in recognition of his services while actually and entirely employed beyond Her Majesty's Dominions with the Egyptian Army.

Obituary.

IT is with much regret that we have to announce the death of one of the most respected of our Colonial colleagues, Mr. Graham Mitchell, F.R.C.V.S., of Melbourne, Australia, well-known and greatly appreciated in the Colony, and in fact, throughout Australasia. It appears that his death was, like several of those we have had to record lately, quite sudden and unexpected, and the sad event was rendered all the more painful from the fact that he died when quite alone, and no one knew of the occurrence until some days (it is supposed ten) elapsed. He had attended the first meeting of the Veterinary Board appointed under the Colonial Veterinary Surgeons Act, on June 4th, leaving in the evening in his usual health and spirits, and his body was only discovered on the 14th of that month. Mr. Mitchell will be greatly missed by the profession generally in Australia; and his presence and advice will be still more missed at the Board meeting above referred to, as he was an authority on all veterinary matters in his part of the world, having gone to Australia in 1854, and assumed a very prominent part in Melbourne, which he maintained throughout his career. He introduced the measure of protective inoculation for contagious Pleuro-Pneumonia, and perfected the opera-

tion to such an extent as to make it very successful and popular. In many other ways he rendered such valuable service to the colony, that his loss is considered a public one. Mr. Mitchell was a graduate of the Dick College, having obtained the diploma of the Highland and Agricultural Society in 1854. He became a member of the Royal College of Veterinary Surgeons in 1871, and a foundation Fellow in 1877. Many of those who were his fellow-students will receive the news of his death with sorrow, as they have remembered him through the long course of years as a genial and sincere friend. The *Melbourne Argus* of June 15th notices his demise as follows:—"It will be learned with regret that yesterday morning Mr. Graham Mitchell, the well-known veterinary surgeon, was found dead in bed at his rooms, Kirk's Bazaar. Mr. Mitchell had not been seen since the 4th inst., and his office remained closed, but no apprehension was at first awakened by the fact, as it was concluded he was out of town. When, however, his absence became prolonged, some anxiety was felt. On Wednesday evening, one of his friends climbed up to the office window, and saw some portions of his clothing lying on a chair. This aroused some anxiety, but still there was a reluctance to break into the place. Yesterday morning the facts were communicated to the police, and the door was broken open. Mr. Mitchell was then found lying dead in bed, in a very peaceful attitude, indicating that he had expired in his sleep. The body was in an advanced state of decomposition. Some letters were found unopened on the floor which had been pushed under the door. Some of them bore the postmark of the 4th inst., and had probably been delivered on the morning of the 5th. It is therefore concluded that he died on the night of the 4th inst. The body was removed to the morgue, where Dr. Moore made a *post-mortem* examination. He found, as had been anticipated, that death resulted from natural causes. An inquest will be held at 11 o'clock this morning. The deceased, who was unmarried, was fifty-four years of age. He was a Fellow of the Royal College of Veterinary Surgeons, and was honorary veterinary surgeon to the National Agricultural Association of Victoria. He was, however, more widely known in connection with the vaccination of children with lymph obtained direct from the calf, in which he took a great interest."

Death has also removed from our ranks one of the senior members of the profession, George Baker, M.R.C.S., M.R.C.V.S., of Reigate, Surrey, who graduated in 1832, but had retired from practice for some years. He had held the office of Member of Council from 1844 to 1849, and acted as an Examiner from 1844 to 1846—the first years of the Royal College.

Mr. Helmore, M.R.C.V.S., who graduated in 1845, died recently at Forestgate. He was a Vice-President of the Royal College from 1859 to 1864, and took a warm interest in the profession up to recent years.

The demise is also reported of W. H. Holmes, M.R.C.V.S., Scarborough, who graduated in 1861; and H. Jennings, M.R.C.V.S., Chelmsford, a graduate of 1876.

The Veterinary Profession in Belgium has recently lost one of its most distinguished members. M. Hugues, Military Veterinary Surgeon (First Class) and Professor of Hippology at the School of War, Brussels, has died after a long and painful illness, at the early age of forty-seven years. Endowed with great ability, and zealous in promoting veterinary medicine, Hugues' reputation extended far beyond his own country, and those who attended the International Congress at Brussels in 1883 will remember the estimation with which his report on Veterinary Teaching was received. He was a member of the Royal Academy of Medicine of Belgium, and of several veterinary societies on the Continent, and was elected a Foreign Associate of the Royal College of Veterinary Surgeons in 1885.

Proceedings of Veterinary Medical Societies, &c.

ROYAL COLLEGE OF VETERINARY SURGEONS.

QUARTERLY MEETING OF COUNCIL, HELD JULY 26TH, 1888,

Professor PRITCHARD, President, in the chair.

Present—Messrs. Barford and Briggs; Professor Brown, C.B.; Messrs. Carter, Cartledge, J. Roalfe Cox, and Dray; Professor Duguid; General Sir F. Fitzwygram; Dr. Fleming, C.B.; Messrs. Greaves and Mulvey; Sir Henry Simpson; Messrs. Jas. Simpson, Stephenson, and P. Taylor; Professor Walley; Messrs. Whittle, Wilson, Woods, Wragg, Thatcher (Solicitor), and the Secretary.

The SECRETARY read the notice convening the meeting.

The minutes of the last meeting were taken as read.

Sir HENRY SIMPSON said he had given notices of motion to the Secretary for them to be entered on the agenda, and received an acknowledgment stating that they would be duly recorded. He wished to say that a special meeting was not required. Some time ago the Solicitor stated that all Council meetings were general ones, except for the alteration of bye-laws. With regard to the proposed addition to Bye-law No. 4, the Charter laid it down that no alteration in the bye-laws could be discussed until it had been suspended for three months after notice given at a Council meeting. Notice of the proposed addition was only given in May, so that the three months had not yet expired.

The SECRETARY announced the receipt of the Annual Report of the Agricultural Department (presented by Professor Brown) and the Annual Report of the Veterinary Department of the Army (presented by Dr. Fleming).

On the motion of Mr. DRAY, seconded by Mr. PETER TAYLOR, a vote of thanks was passed to the two donors.

CORRESPONDENCE.

Letters were announced—

From Mr. Wilson and Mr. Stephenson, thanking the Council for the honour of their election.

From Mr. J. Caldecott, a student, asking to be allowed to join Professor Williams's College next April, and go in for examination in May.

It was decided that this was simply a question for the School to consider.

From Mr. Gibson, asking that a student who would attain the age of twenty-one in June might be allowed to go in for his examinations in May. The Secretary was instructed to refer him to the bye-law.

From the Royal Commission on Horse-breeding, and from the Royal Agricultural Society, suggesting a conference of members of the profession on the question of "soundness."

Dr. FLEMING said this was a very important matter. Hitherto the veterinary profession had been entrusted with the duty of examining horses and reporting whether they were sound or not, especially for stud purposes. He thought the Royal College of Veterinary Surgeons should accept the offer which had been made, and undertake the duty of reporting to the Commission as to the defects which should disqualify a horse for breeding purposes. The question of soundness and unsoundness was of the highest importance to the country. Upon the opinion at which the members of the College arrived would depend the passing or the rejection of highly valuable horses. He therefore thought that a committee should be appointed to draw up a report which should be worthy of the College.

Professor WALLEY agreed with Dr. Fleming as to the importance of this subject. It affected England more than Scotland, because in the Agricultural Society of Scotland the question of "soundness" seldom or never arose, or in other words, there was no examination for "soundness."

Mr. STEPHENSON considered that no investigation and no committee would

settle this question. They might all agree that spavins, ringbone, etc., constituted "unsoundness," but the difficulty arose when one professional man said a horse had a spavin and another said it had not.

Mr. WILSON said the point was what were the diseases which rendered a horse unsound for breeding purposes. He suggested that the matter should be referred to a committee of the whole Council. A sub-committee might be appointed to draw up a list of subjects for consideration.

The PRESIDENT said he quite concurred in the general remarks made by Dr. Fleming and Professor Walley. He thought the work should be undertaken, and that whatever difficulties arose should be dealt with to the best of their ability. He had not the slightest doubt that almost insurmountable difficulties would be met with. Would any veterinary surgeon holding the diploma of the College like to take the responsibility of going into a showring and saying that a horse with a spavin was "sound" or "unsound"? At the same time, the Royal College of Veterinary Surgeons ought to feel itself honoured by being asked by the Royal Commission on Horse-breeding and the Royal Agricultural Society to take upon itself the responsibility of laying down certain rules for the guidance of breeders in such cases.

Mr. P. TAYLOR also agreed that the question was a most important one.

Dr. FLEMING moved, "That the Royal College of Veterinary Surgeons undertake the duty which it has been asked to undertake."

Mr. CARTLEDGE seconded the motion.

Mr. JAMES SIMPSON thought that the Royal College of Veterinary Surgeons was the right body to deal with the subject. If they shirked the task veterinary surgeons would in future be dispensed with.

Professor BROWN said he knew privately that what was thought to be expedient was that the Council should summon a conference of a number of veterinary surgeons to discuss the matter, and decide what was hereditary "unsoundness."

Mr. JAMES SIMPSON considered that the letters called upon the Council as a representative body to state what were the "unsoundnesses" that should be considered hereditary.

Professor BROWN said that what the Royal Commission wanted was that the Council should convene a conference of members of the veterinary profession.

Sir HENRY SIMPSON said that last year, having had the subject brought before him, he ventured, as President of the Royal College of Veterinary Surgeons, to suggest that a conference of veterinary surgeons and stewards of horse-shows and exhibitions should be held. People were getting weary of the diversity of opinions that had been expressed. The differences were not on matters of fact, but as to the value which should be attached to certain defects. He quite agreed with Dr. Fleming's suggestion, which affirmed the principle that the College should undertake the duty.

The motion, "That the College undertakes the duties as requested by the two societies," was carried unanimously.

The next letter was from Professor McQueen, tendering his resignation as Examiner in Botany.

On the motion of Mr. WOODS, seconded by Mr. DRAY, the resignation was accepted.

On the motion of Dr. FLEMING, a vote of thanks was passed to Professor McQueen for the services he had rendered to the Royal College of Veterinary Surgeons.

A letter was announced from Mr. W. Hunting, enclosing copy of a new weekly journal for the profession, asking that copies of the report of the meetings of the Council might be supplied to him.

On the motion of Mr. WRAGG, the application was agreed to.

A letter was announced from Mr. Gadsden, enclosing copies of testimonials in favour of Mr. Wheat, veterinary surgeon, Philadelphia, and asking that he might be granted a degree.

On the motion of Dr. FLEMING, seconded by Professor WALLEY, it was agreed "That an answer be sent stating that the Council regret extremely that the request cannot be complied with."

The SECRETARY announced that the Privy Council had confirmed the decision of the Council of the College, that Mr. Fox, a farrier practising in India, was not entitled to registration, which he had applied for.

A letter was read from Mr. Dale, dated June 15th, 1888, stating that he had ceased to use the term "Veterinary" in connection with his name.

A MEMBER said that Mr. Dale's name still appeared in Directories with the letters "M.R.C.V.S." following.

A MEMBER said that for three or four years Dale had been engaged as an office-boy. After a time he was entrusted to mix medicines, give balls, and assist in operations. Dale gave out that he was "Mr. F. H. Dale, late assistant to Professor Pritchard, M.R.C.V.S."

A MEMBER said that on a card issued by a farrier it was stated that the veterinary in attendance was Mr. F. H. Dale. In his opinion it was one of those cases that ought to be made an example of, and he was quite prepared to move that the Solicitor be instructed to prosecute.

After some further discussion, it was agreed "That the Solicitor be instructed to inquire into the case, and if he sees good grounds for prosecuting, to do so."

A letter was announced from the Solicitor referring to certain cases that he had been asked to consider, and on the motion of Mr. BARFORD, seconded by Mr. CARTLEDGE, it was agreed "That in the cases of those gentlemen who are to be prosecuted at long distances from London, the Solicitor be empowered to employ local solicitors."

Dr. FLEMING said it was evident that, as time went on, the expenses to which the College would be put in such matters would be very serious. He thought the time had arrived when the Lords of the Privy Council should be asked to allow the fines to go to the College, for by such prosecutions they were protecting not only the profession, but the public. In almost every other instance the penalties inflicted on impostors went to the public body which by charter or Act of Parliament was empowered to prosecute. He would therefore move "That steps be taken to represent to the Lords of the Privy Council the position of the College with regard to these prosecutions."

Professor WALLEY seconded the motion, which was agreed to.

Sir FREDERICK FITZWYGRAM, referring to the horse-tax, said that when the Bill was first introduced he asked the Chancellor of the Exchequer whether he would give to veterinary surgeons the same privileges as those given to medical men, and the answer was in the affirmative. When the Bill was printed, however, veterinary surgeons were omitted; and on being reminded of his promise, Mr. Goschen said, "I find that whatever exemptions I make cause application for a dozen more exemptions on somewhat similar grounds; but if you will put down a motion in the House to exempt veterinary surgeons I have no objection to it. But let it be your act and the act of the House, not mine. Whether I can grant it or not will depend upon the temper and tone of the House, but if there is an expression in favour of the exemption of veterinary surgeons I shall be very pleased to grant it." It appeared to him that the question of success mainly rested on the members of the College using their influence with Members of Parliament, in order to get them to support the motion to exempt veterinary surgeons. If Members who were interested in the profession were asked to give their assistance, and to be in the House when the motion came forward, he did not think there would be much difficulty about it.

Dr. FLEMING considered that such exemption would pave the way to the removal of the hardship of being liable to be summoned as jurymen.

The PRESIDENT said he was personally very much obliged to Sir Frederick Fitzwygram for bringing the matter before the Council. He should do everything in his power to get his friends in the House of Commons to support Sir Frederick's motion.

The SECRETARY read notices of motion from Sir Henry Simpson and Mr. Cox, relating to the appointment of committees and additions to bye-laws.

A letter from Professor Walley was read, proposing that the power given to the Chairman of the Board of Examiners to exclude obnoxious persons from the examination-room should be withdrawn.

Professor WALLEY said that if a teacher were excluded from the examination-room he had not an opportunity of knowing on what lines the examinations were conducted. Such exclusion should not be for all time.

Dr. FLEMING said that he was perfectly sure that no Chairman of the Examining Board would exclude any person without consulting his colleagues, and therefore it should be left to the Chairman to decide how long the exclusion should last.

Professor WALLEY: Was this matter considered by the Examining Board?

The PRESIDENT: Unquestionably, and agreed to by the whole Board.

Mr. J. SIMPSON stated that he had been informed by the Secretary that since the last meeting of Council the right of entrance from the College back yard to the street had been exercised, and workmen had made use of it from June 30th to July 5th.

A MEMBER proposed that the name of Mr. Harland be struck off the Register, he having been convicted at Sunderland and sentenced to six months' hard labour for horse-stealing.

The motion was agreed to, twenty-one members of Council being present.

The SECRETARY read the report of the Finance Committee, which recommended that any Examiner living outside a radius of 100 miles from the place of examination be allowed his first-class travelling expenses.

On the motion of Mr. DRAY, seconded by Mr. WRAGG, the report was adopted.

On the motion of Professor WALLEY, seconded by Mr. CARTER, the report from the Court of Examiners was taken as read, received, and adopted.

On the motion of Professor WALLEY, seconded by Mr. WRAGG, the report on the Examination for Fellowships was taken as read, received, and adopted.

Professor Brown, Professor Pritchard, Professor Duguid, Dr. Fleming, and Mr. Cox were nominated as Examiners for the Fellowship degree.

A ballot was taken, with the result that the following were elected: Professor Brown, Professor Duguid, and Dr. Fleming.

On the motion of Mr. CARTLEDGE, seconded by Mr. CARTER, the Parliamentary Committee were re-elected, with the addition of Sir Henry Simpson.

On the motion of Sir HENRY SIMPSON, seconded by Professor WALLEY, the Museum Committee, the House and Building Committee, and the Library Committee were amalgamated into one General Purposes Committee.

The former members of those Committees (with the exception of Mr. Harpley) were re-elected, with the addition of Sir Henry Simpson and Mr. Wilson, on the motion of Professor WALLEY, seconded by Mr. BARFORD.

On the motion of Mr. BARFORD, seconded by Mr. WHITTLE, the Registration Committee were re-elected, with the addition of Sir Henry Simpson and Mr. Wilson.

The Examination Committee (consisting of the whole of Council) and the Bye-laws Committee (with the addition of Mr. Mulvey), were reappointed.

The Finance Committee were reappointed, with the addition of Sir Henry Simpson and Mr. Wilson.

The Dinner Committee were reappointed, with the addition of Mr. Wilson.

It was agreed that a list of committees be printed and circulated.

The obituary notice was read.

Mr. WRAGG gave notice that at the next meeting of Council he would move that a committee be formed to report on the best means of carrying out the suggestion of the Royal Agricultural Society and the Royal Commission as to a conference on "Soundness."

Mr. J. SIMPSON moved, "That to enable the Registrar to issue a corrected list of existing practitioners who are entitled to have their names entered in Register No. 3 under the Veterinary Surgeons Act of 1881, he be instructed to obtain the required information under the power given to him by Section 5 of the Veterinary Surgeons Act of 1881; that the necessary inquiries commence forthwith, and that the Registrar be allowed such additional clerical help to enable him to make the necessary investigation as may appear reasonable to this Council."

Dr. FLEMING seconded the motion, which was agreed to.

A vote of thanks to the President concluded the proceedings.

ROYAL COUNTIES VETERINARY MEDICAL ASSOCIATION.

A MEETING of this Association was held at Henley-on-Thames on 27th July. The attendance included Mr. F. W. Wragg (President), who occupied the chair; Professor Pritchard, Professor Walley, Sir Henry Simpson, and Messrs. H. Kidd (Hon. Sec.), J. P. S. Walker (Hon. Treasurer), J. F. Simpson, E. J. Mellett, J. D. Barford, W. J. Mulvey (London), A. C. Barlow, W. Hunting, E. C. Howard, R. Page Bull, W. Woods, H. G. Rogers, and W. A. Hunting.

The Hon. SECRETARY announced the receipt of letters of apology from several members, and said he was sorry to have to report the loss by death, since the last meeting, of three members of the society—viz., Mr. Rostron, of the 2nd Life Guards; Mr. Harpley, of London; and Mr. Hunt.

The PRESIDENT was sure every member deplored the death of these three gentlemen. (Hear, hear.)

Mr. BARFORD proposed that letters of condolence with the families of the gentlemen named be sent, expressing the sympathy of the society with them in their bereavement.

Mr. MULVEY seconded the resolution, which was carried unanimously.

Mr. Hatton, of Richmond, Surrey, was unanimously elected a member.

PURCHASE OF INSTRUMENTS.

The PRESIDENT said that the Committee appointed to draft a scheme for the purchase of instruments for the use of the members of the Association had been called to meet before the annual general meeting of the society; but as only four members attended, they arranged for a further meeting that day. The train service, however, prevented them from meeting in time, so that he thought the business had better be deferred to the next meeting, when no doubt a scheme would be ready.

After some discussion, it was agreed, on the proposition of Mr. SIMPSON, seconded by Mr. MULVEY, to discuss the matter at the present meeting.

Sir HENRY SIMPSON then moved "That the committee be requested to undertake the purchase of a complete set of dental instruments, if in their opinion such a course was desirable." Those instruments would, he had no doubt, be purchased before another month was over, and they could be added to as funds allowed.

Mr. MELLETT seconded the resolution, and it was carried, as was a subsequent motion "That the President for the time being have the care of such instruments as may be purchased," and it was left to the committee to draft

a code of rules, to be submitted to the next meeting, to regulate the lending of these instruments.

PLACE OF NEXT MEETING.

On the proposition of the PRESIDENT, seconded by Sir HENRY SIMPSON, London was unanimously selected.

A most interesting and exhaustive paper was then read on

OPHTHALMIA,

by Professor WALLEY.

Mr. SIMPSON said the subject was one of such importance that it could hardly be fully dealt with that day. He begged therefore to propose that the discussion be postponed until their next meeting, and that Professor Walley would kindly allow his valuable paper to be printed and circulated among the members of the Association, in order that they might fully acquaint themselves with its contents in the meantime.

Professor PRITCHARD seconded the motion.

Professor WALLEY expressed his readiness to allow the paper to be printed. The only objection to the course proposed was that the essayist got little chance of hearing the discussion and replying to it; and he would ask them to have notes of the discussion taken, so that if he could not attend he might send a written reply, to be read at the following meeting.

Mr. WOODS tendered to Professor Walley his hearty thanks for his valuable paper. He did not agree with the Professor, however, that colliery horses were more liable to go blind than others. In his younger days he had a good deal to do with inflammation of the eyes, Ophthalmia, in pit horses, but now he rarely saw a case. He attributed the improvement to better hygienic treatment of the ponies. In most stables where there were twenty or thirty ponies the return air that had gone all round the colliery ultimately passed through the stables. They were very ill-ventilated. Some time ago he particularly noticed over 200 ponies that had been turned out of the pits owing to a strike, and although some of them had been underground eleven or twelve years, he did not find one afflicted with Ophthalmia. If they were brought up at night, which he always insisted upon, they were not affected at all.

Professor WALLEY replied that in making the statement he said that "in his experience" it had been the case that pit ponies were more likely to become blind than other horses. He had had some experience of Ophthalmia in pit ponies. Some years ago Mr. Mulvey was kind enough to procure for him a truck-load of pit ponies for dissection, and out of the six or eight there was scarcely one without Ophthalmia.

The resolution was carried unanimously.

THE HORSE-TAX.

Sir HENRY SIMPSON brought this subject before the meeting. As they were aware, there was a proposal to tax all horses used by professional men, as under the old Act; but there was under the latter exemption in certain cases. Veterinary surgeons, however, were not exempt. Some time ago, when the Budget Bill was contemplated, the Chancellor of the Exchequer said "medical men" would be exempt; and he (Sir Henry) being then President of the Royal College, ventured to emphasise the fact that veterinary surgeons were medical men, and ought to be entitled to exemption. (Hear, hear.) Mr. Goschen's secretary wrote to him that the matter should have the best consideration of the Chancellor of the Exchequer. Sir Frederick FitzWygram saw the Chancellor, and he promised him that veterinary surgeons should be exempt. The Bill came out the other day, and veterinary surgeons were not included in the exemption, the definition of persons entitled to exemption in respect of one horse being "physician, surgeon, or apothecary." Sir F. Fitzwygram saw the Chancellor of the Exchequer, who admitted it was true that

he had said so, but stated that claims for exemption were coming in from all quarters, and that he had therefore determined to adhere to the lines of the old Act; but he added that he should not oppose a motion in the House to exempt members of the Royal College of Veterinary Surgeons in practice. The matter was not one of £1 a year, but the great thing was for them to try to get exempt, because that would ally them in status with the physician and surgeon. Sir F. FitzWygram was anxious that Members of Parliament should be approached, in order that when he moved the amendment, as he was prepared to do, they would support him. Sir Frederick brought the matter before the Council of the Royal College yesterday, and he (Sir Henry Simpson) hoped those present would act on the hint.

On the proposition of the PRESIDENT, a hearty vote of thanks was given to Professor Walley for so kindly reading a paper at this Association.

On the motion of Mr. BARFORD, a cordial vote of thanks was given to the President for presiding. H. KIDD, *Hon. Sec.*

LANCASHIRE VETERINARY MEDICAL ASSOCIATION.

THE usual quarterly meeting of the above Association was held in the Medical Institute, Hope-street, Liverpool, on June 13th, at 6.30 p.m., tea having previously been partaken of at the Adelphi Hotel.

Present: Mr. J. B. Wolstenholme (President), Prof. Williams, Messrs. Thos. Greaves, W. A. Taylor, T. Hopkin, W. Dacre, J. W. Ingram, and S. Locke, Manchester; R. C. Edwards, Chester; Jas. Eltaft, Lancaster; Thos. Briggs, Bury; R. C. Trigger, Newcastle-under-Lyne; A. M. Michaelis, Stockport; W. Woods, jun., Wigan; W. Whittle and Arthur New, Worsley; Thomas Dobie, Birkenhead; R. S. Mitchell, Geo. Morgan, and the Secretary, Liverpool.

Apologies, regretting their inability to attend, were received from the following gentlemen:—Profs. McCall, Walley, and Axe; Messrs. J. Malcolm, J. B. Taylor, W. H. Bridge, E. Faulkner, E. Day, H. Kidd, Jas. Storrar, J. S. Hurndall, Jas. Marshall, J. G. Mayor, A. H. Darwell, John and Alexander Lawson, Peter Taylor, and Isaac Vaughan.

Proposed by Mr. W. A. TAYLOR, seconded by Mr. T. HOPKIN, that Mr. John Moore, M.R.C.V.S., of Manchester, be elected a member of the Association.—Carried unanimously.

It was proposed by Mr. WHITTLE, seconded by Mr. MORGAN, that the amended rules be referred back to Committee, and be submitted to the next ordinary meeting.—Carried unanimously.

Mr. W. A. TAYLOR then read an excellent paper "On certain Intestinal Symptoms and Functional Disorders in the Horse," which has already appeared in the VETERINARY JOURNAL.

The PRESIDENT thanked Mr. Taylor for offering to write a paper at such short notice, and invited discussion.

Mr. GREAVES, in opening the discussion, also thanked Mr. Taylor. He had performed his duty well. It was a subject they all had experience of, as no class of cases were more frequent than those treated of in this paper. He always had given, and still continued to give, purgatives in protracted abdominal pain. In occasional cases he believed in judicious blood-letting. He believed in tapping in cases of Tympanitis.

After a few words from Mr. R. C. Edwards, Prof. WILLIAMS also thanked Mr. Taylor for his excellent observations. The treatment of this class of diseases had greatly improved since his younger days. He regarded turpentine as a valuable remedy, and one of the best antiseptics we can possibly have. He was led to observe this in preserving morbid specimens. In cases of abdominal pain, he regarded opium as the sheet anchor, as it was necessary in such cases to place the bowels in a state of repose, and unless such was

done, it was impossible to overcome Inflammation. If the pulse was not excited, and under, say fifty, he would give a dose of physic and expect good results; but later on the bowels will not stand any irritation. He expressed great confidence in puncturing, and was sorry he did not commence it earlier in life. He would not hesitate to puncture in gastric Tympanitis. After further discussion, in which Mr. Dacre, Mr. Hopkin, Mr. Trigger, Mr. Locke, and Mr. Briggs took part, Mr. W. A. Taylor replied to the various criticisms on his paper.

Mr. HOPKIN then exhibited a specimen of the bowels of a case of Lymphadenoma. During life the horse had passed occasional calculi, and several others were discovered in the intestines *post-mortem.*

The history of the case is as follows:—The attack lasted about a fortnight, with slow abdominal pain, the patient stretching out as if about to urinate. Food was taken up to the last twenty-four hours, when he gradually sank and died. On a *post-mortem* examination being made, there was observed this enormous thickening of the bowel, and enlargement of glands, especially of Peyer's patches, many of these being as large as half-a-crown.

The SECRETARY also exhibited the tail, penis, and scrotum of a horse destroyed two days previously for Melanosis, and detailed the history, etc.

A very cordial vote of thanks was proposed to Mr. W. A. Taylor by the PRESIDENT, seconded by Mr. R. C. EDWARDS, to which Mr. Taylor suitably replied.

Mr. Hopkins and the Secretary were also the recipients of the thanks of the members for their exhibition of morbid specimens.

The usual vote of thanks to the President concluded a most successful meeting. ARTHUR LEATHER, *Hon Sec.*

NORFOLK AND EASTERN COUNTIES VETERINARY MEDICAL ASSOCIATION.

A MEETING of this society was held on July 24th, at the Red Lion Hotel, Cambridge. The President, Mr. John Hammond, occupied the chair. Nearly twenty members were present, and a number of letters of regret from others were read by the Secretary.

Some conversation occurred concerning the stained-glass window given by the Norfolk, in conjunction with other societies, to the Royal College of Veterinary Surgeons. General regret was expressed that the colours were not in harmony with those of the other windows, and some objection was taken to the delineation of a horse forming part of the design. It was, however, resolved to accept the window, and to authorise the secretary to pay for it.

The next subject for consideration was the recent election of Councilmen.

Mr. BANHAM detailed the original compact made between six societies, for mutual help and combined action in the selection and election of members as candidates for the Council. Two societies each year selected gentlemen as candidates, communicated their names to the other societies, and then the whole six collectively recommended them and individually voted for them. At last election it became the turn of the Lincolnshire and of the Norfolk Societies to select candidates. This was done, and the other societies appealed to for the usual support. A want of unity was at once apparent, and in some quarters it was soon made evident that the assistance, which had, in previous years, been given to candidates selected by the societies, was not to be reciprocated. In previous years the united societies had always been successful in carrying their candidates—this year they failed, and the inference is natural that the other societies had not given the support they ought to have done. If this were so, it was extremely unfair to the Lincolnshire and Norfolk Societies, who had always acted to the best of their power in assisting the nominees of other societies, and had a right to expect

the same generous help and honest support that they had given. He especially complained that Mr. Jas. Simpson should have permitted himself to become a candidate in opposition to the selected men, and that, too, after a statement at the Norwich meeting that he did not intend to stand. He complained also that Sir H. Simpson, at a meeting of the Royal Counties Society at Reading, should have suggested that the Norfolk and Lincolnshire Societies had, in the selection of their candidates, failed to comply with some rule or custom necessary to the conjoint action of the other societies.

Mr. WRAGG said he remembered Mr. Simpson's speech at Norwich, when he opposed the Norfolk Counties selection on the plea that no examiner should also be a member of Council. He also remembered his statement that he himself was not going to stand for election, and was much surprised when that gentleman appeared as a candidate.

Other members continued the discussion in a somewhat conversational manner. All appeared to think the two societies who had this year the right to selection of joint candidates had just cause of complaint, and this feeling was later expressed in a resolution, that—"The President be requested to communicate with Sir Henry and Mr. Jas. Simpson concerning their remarks at Norwich and Reading in relation to the candidature of gentlemen proposed by the Lincolnshire and Norfolk Societies."

The PRESIDENT then read his inaugural address.

GENTLEMEN,—My first duty is to thank you, in the warmest terms at my command, for the honour you have conferred upon me, in electing me to preside over our meetings during the present year, an honour which, believe me, I esteem the greater when I remember those gentlemen who have preceded me; and feeling, also, that there are amongst you some far more capable of fulfilling the duties pertaining to the position than I am.

Living, as I do, in a small remote country village, four miles from the nearest telegraph office, with a multiplicity of business, "a quiver full of them," and the winter of life approaching, I feel you have placed me in a position difficult to fill with satisfaction. I must therefore ask your kind indulgence, forgiving my negligences, ignorances, and shortcomings. One thing I can promise you in return, I will endeavour to emulate my predecessors for the welfare of this association.

The Norfolk and Eastern Counties Veterinary Medical Association was instituted in 1868, and in 1869 the number of members admitted was 29, viz., 20 Norfolk, 3 Suffolk, 3 Essex, 2 Cambridgeshire, and 1 Lancashire. At the last meeting of the association, by a singular coincidence the same number (or nearly so) of members, belonged to this association. These medical societies are represented to be harbingers of good, by the free interchange of opinion (when conducted in a right spirit), advancing their members both mentally and socially; asperities are rubbed down, and thus a friendly understanding is promoted. Veterinary surgeons in the Eastern Counties cannot possibly appreciate these advantages, or such indifference, such apathy, would not have crept over them. We have had, however, special opportunity for seeing and hearing distinguished members of the profession from a distance, who have kindly come to take part in our meetings, and by their presence, and the value of their communications, they have given vitality and interest to the proceedings.

The register, issued 1885, showed there were 57 veterinary surgeons in Norfolk, 21 in Cambridgeshire, 22 in Suffolk—total 101. Cannot something be done to induce these gentlemen to join us? It is often easier to diagnose a case than to prescribe a remedy; and in this matter, to which I have given some little consideration, I feel myself in that dilemma. We find the more open, the broader, the wider the basis of prizes given at agricultural shows,

the more entries we obtain. Again, until lately the words "Norfolk" and "Suffolk" were prefixed to the name given to our Red Polls, now they are simply called "Red Polls" to the benefit of the breed. Upon the same principle, I would suggest that this Association in future be named the "Eastern Counties Veterinary Medical Association," omitting the word "Norfolk."

I am informed by Mr. Overed, that circulars were sent, some years since to veterinary surgeons residing in the Eastern Counties, but possibly during the lapse of time many of the professional gentlemen now living in these localities are fresh comers. I would therefore propose that a circular be sent to all veterinary surgeons living in Norfolk, Cambridgeshire, and Suffolk, inviting them to join us. I am confident that, by this means, we should be successful in gaining new members.

Although at present the migration of the society's meetings has borne but little fruit, I feel certain it is a step in the right direction, and will prove sooner or later most advantageous.

I do not presume to dictate, but simply to suggest, because there are indefatigable members here who were at the birth of this Association, and also at its resuscitation, and who still take the deepest interest in its success and welfare: *palmam qui meruit ferat.* Mainly to their fostering care this Association owes it existence.

My next duty is less easily performed (not that there is any lack of material). My difficulty is to select some subject or subjects suitable for your consideration; after which I trust members present will introduce some interesting pathological specimens for our inspection and discussion.

To look back and see what changes have been wrought in almost every branch of our profession, is really surprising. I am unable, and it would be impossible in the limits of your patience, to allude to all advances. I will therefore confine myself strictly to some of those in which I have had personal experience, and carried out in practice during the forty years I have been actively engaged as a country veterinary surgeon.

1.—Diseases Prevented or Mitigated in Severity.—The diseases of the bowels arising from horses being supplied with food of a coarse and indigestible nature, were formerly very numerous. Barley haulm, or what is called in Norfolk "chaff," constituted a large proportion of their dry provender, and this without the admixture of other substances of a less irritating and more digestible character. Acting on my advice, several of my employers have given up this system of feeding, while others have substituted cut hay and pulped roots, using only a proportion of barley chaff with their corn. With these alterations in the diet, the number of cases of Enteritis and other affections of the digestive organs have considerably diminished.

Increased attention to sanitary arrangements has, to a large extent, prevented, controlled, and lessened the mortality of many epidemic diseases, notably Influenza, and other affections of the respiratory organs. Where large numbers of horses were crowded together in stables neither ventilated nor drained, these diseases committed sad havoc. Stables are now constructed under the modern laws of hygiene, and have a sufficient supply of pure air and light, with a proper system of drainage. Of no less importance is it to attend to the water supply of animals. This was fomerly in many cases derived from pits but little better than cesspools; but horse-keepers have learned the value of a pure running stream or spring.

The number of cases of Black Leg or Black Quarter (Symptomatic Anthrax) has materially decreased of late. This is probably due to animals being kept in a thriving condition, so that at no period during their lives do they experience a sudden change from poor to over much and nutritious food.

The disease among cows known as Black or Red Water was very prevalent in winter, especially when the animals were fed on roots grown on wet or impoverished soils; it has now become far less frequent in my practice. This is to be mainly attributed to the more effectual drainage and better cultivation of our lands.

Scarcely a disease among the bovine species is more amenable to prophylactic treatment (contagious diseases excepted) than Parturient Apoplexy. I believe by withholding food of a stimulating or indigestible nature, the exhibition of a few saline purges, and the abstraction of a fair quantity of blood immediately previous to calving, the disease can be modified in intensity, if not altogether prevented. As an illustration of the beneficial effect of bleeding I may cite the following:—An employer of mine, whose cows were very susceptible to Milk Fever (probably on account of his high feeding), regularly bled them prior to calving, and I never attended a fatal case after he adopted this procedure. This practice was, however, discontinued, and in less than six months I was called to treat two cases that terminated fatally in twelve hours. My own herd of Red Polls affords another illustration of the protective efficacy of bleeding. The great-grand-dam of my present stock had three attacks of Milk Fever, to the last of which she succumbed. Several of her progeny were similarly susceptible. For the last ten years I have withdrawn about twelve pints of blood from the animal a short time before calving, and since this treatment has been followed a fatal case has never occurred.

The losses incurred among pregnant ewes, due to dietary errors, have been very heavy. It was the custom among flock-owners, during the latter periods of gestation, to allow their ewes far too large a quantity of roots, without sufficient dry food. This being insufficient in itself to meet the requirements of both dam and fœtus, not only abortion and premature births followed, but also often a state of general paralysis (locally known as Staggers), caused from anæmia of the brain. A small quantity of roots, a liberal allowance of artificial food with cut hay, and a fair amount of exercise, have now been productive of wonderful results.

I have endeavoured to show, in a few instances only, the manner in which we have been successful in the prevention of disease and lessening its mortality by attention to dietetics, sanitation, and other prophylactic measures, and it now remains for me to briefly record the progress attained in some branches of veterinary medicine and surgery.

Influenza, from its great prevalence and fatal character, has always excited much interest and discussion among veterinary surgeons. In an essay on this subject, in the "Abstract of the Proceedings of the Veterinary Medical Association" during its first session, 1836, I find the treatment pursued and recommended consisted of bleeding, the administration of aloes and sedative medicines, with a consequently high death-rate. But since its specific nature has been recognised, and repletive measures substituted, the fatal cases have been considerably reduced. I have found the thermometer of great service in detecting this disease during its incubation, the temperature invariably rising from 105° F. to 107° F. in the thoracic form, before any other diagnostic symptoms can be detected; and, as early segregation of the affected animals is of the first importance, in any attempt to arrest the progress of an outbreak, the value of this instrument cannot be over estimated.

No honest or impartial observer can fail to recognise the innumerable benefits conferred on mankind and the domestic animals through the introduction of antiseptic surgery. Sir Joseph Lister conclusively proved that the putrefaction and infection of wounds, with their evil consequences, pyæmia, septicæmia, etc., had their essential factors in the admission and develop-

ment of certain micro-organisms. The exclusion or destruction of these germs (as they are called) forms the basis and guiding principle of antiseptic surgery. Formerly, we neglected to obey the common rules of cleanliness, and numbers of animals perished annually from some form of blood poisoning; but now, by carefully removing all foreign material from a wound, providing free drainage, applying some antiseptic dressing, and protecting the parts from the deleterious contact of the atmosphere, we are enabled to treat successfully injuries that formerly frequently terminated fatally.

The retention of the fœtal membranes in the mare has hitherto caused much anxiety; but by mechanically detaching the placenta, and thoroughly irrigating the uterus with water holding in solution such agents as bichloride of mercury, carbolic acid, etc., by means of a stomach pump, little fear need be apprehended.

Perhaps one of the greatest advances in practical therapeutics is the administration of the active principles of our drugs by hypodermic or intravenous injection. By this method we obtain the full physiological action of an agent in a minimum of time. In cases of acute pain arising from almost any cause, a few grains of the mixture of Morphia and Atropia will generally give immediate relief. In Physostigmine we possess a potent remedy for the relief of impaction of the bowels; given hypodermically in doses of from 1 to 2 drs., it increases both the peristaltic action and the secretion of the bowels, and I have frequently seen it produce an evacuation in a hour. Of course, its use is contra-indicated when actual Enteritis exists. The salts of Cocaine I have found of great service as a local anæsthetic. The introduction of a few minims of 5 per cent. solution into the eye renders the removal of a foreign body, such as an oat flight (or glume), a comparatively easy task. I have also excised small fibrous growths from the horse, without casting him, by previously injecting a solution of this agent at different points around the base of the tumour.

SURGERY.—In Veterinary Obstetrics again we have made much progress. In cases of deformity of the pelvis of the dam, or congenital malformation and displacement of the fœtus, where the act of parturition is attended with difficulty, by modern appliance it is easy enough to remove a limb of the fœtus, and thus facilitate delivery.

The improvement in instruments has considerably aided us in dental operations. Most veterinary surgeons are acquainted with the troubles that often arise from decay or irregularity of the molars, and the difficulty hitherto experienced in their extraction or levelling. By the use of the modern tooth shear and forceps, with a little manipulation and strength, these difficulties can be surmounted.

In dealing with Flatulent Colic, surgery has materially assisted us. In the summer months, when horses are allowed to devour a quantity of wet, succulent grass (after a long fast), it frequently undergoes fermentation, thus producing over-distention of the bowels from the gases evolved. I have repeatedly seen animals die in this condition from rupture of the bowels, or from the pressure of the abdominal viscera on the thoracic cavity. In such cases now, where extreme dyspnœa exists, I at once proceed to puncture the bowel at the most prominent part of the right side with a fine trocar; in most instances the relief has been immediate, and the results most gratifying.

I will conclude by relating the history of

AN OUTBREAK OF "ACTINOMYKOSIS,"

which has occurred in my practice.

The disease has been found to be due (thanks to the investigations of Bollinger and others) to a minute fungus, the *actinomyces*, the spores of which, on being implanted in a suitable soil, grow and propagate.

The ravages of this pest are not confined to our domestic animals, several cases having been reported in the human subject. Strange to say, in mankind it has a marked tendency to produce suppuration; in our animals, to the formation of tumours and tumour-like nodules.

Both Johne and Ponfick have been successful in transmitting the disease by inoculation from one of the bovine species to another, thus proving it to be of a contagious nature. The history of this outbreak tends to the same conclusion; but it is most difficult to account for the number of isolated cases we so frequently encounter.

The ox is the animal most commonly affected; but Professor MacFadyean has lately demonstrated the presence of this parasite in the growth removed from the spermatic cord of a horse, and he is inclined to believe that many of the so-called "Scirrhous Cords" are of this origin. Professor Axe contributed some valuable information upon Actinomykosis in 1882. That the prognosis and nature of this malady were little known to the majority of practitioners is shown by the answers given to the questions, and published in the *Veterinarian* at that time. The anterior portions of the digestive and respiratory tracts seem to be the favourite seat of the disease. When affecting the tongue it was formerly known by such names as Scirrhus, Cancer, Glossitis, Tubercular Stomatitis, etc. Various theories have been advanced as to the mode in which the fungus gains admission into the deeper structures of the tissues. Some consider an abrasion of the mucous membrane necessary, while others believe it quite possible for the spores to enter by way of the small ducts of the glands.

As a result of the irritation and consequent inflammation occasioned by this endophyte, various degenerative changes occur. The tongue at first becomes enlarged, and beneath the mucous membrane can be felt small nodules, either confluent or discrete, and varying in size from a millet seed to that of a walnut. These subsequently soften, and discharge a cheesy-looking substance, leaving a ragged ulcer, from the base of which luxuriant granulations arise. The organ now becomes diminished in size, from the growth and contraction of fibrous tissue, and atrophy of the muscular elements.

If the disease is allowed to run its course, the animal usually succumbs either to inanition, or to secondary growths invading some of the deeper structures.

The farm on which this outbreak of Actinomykosis appeared is healthily situated, adjoining the sea, and consists mainly of a light chalky soil. The disease was first recognised in 1882, when several animals were affected and slaughtered.

In 1885, four bullocks were affected, and suffered a similar fate. I detected a large growth invading the walls of the abomasum in one of these, which a microscopical examination proved to be an actinomykotic tumour. No further case was reported until 1887. About twenty bullocks were then purchased in the beginning of the summer, and grazed on the marshes by the sea. They were taken into the yards at the commencement of the winter (October), one lot being retained at the home farm, and the other sent to the field barn, about a mile distant. They were attended to by different men, so that there was no communication between the two yards. Their food consisted of sliced roots, chopped ensilage, barley, chaff, and cake.

On December 3rd, the man at the barn observed one of the animals to have a difficulty in masticating his food, and to be discharging a quantity of saliva. During the two or three following days he ate but very little, and on seeing him on the 26th, I had no difficulty in diagnosing it to be a case of Actinomykosis.

The bullock was in rather poor condition, the tongue was much swollen, and protruded from the mouth. It was hard and tender to the touch, and in the middle third were two large superficial erosions, with ragged edges. The sides and dorsum generally were studded with nodules of different sizes, which on being incised were found to contain a quantity of caseating material. On closer inspection by means of the microscope, this was found to consist mostly of degenerated cells and actinomyces in various stages of development. A few days after, three other animals were discovered to be affected, and as two of these were in good condition they were sold to the butcher. About this time (December 9th) the disease was detected in two of the beasts at the home-farm, and they were immediately isolated. In the latter part of December, ten beasts were bought from a dealer and placed with those at the home farm. On February 16th (that is seven weeks after), the attention of the owner was directed to two of the newly-purchased animals, and their symptoms being suspicious, he had them removed at once, and communicated with me. One of these had the disease in a very acute form, the free portion of the tongue being literally covered with ulcers. The hard palate was also affected at the spot where it came in contact with the diseased structures. The following is a short outline of the treatment I have successfully pursued:—The animals have been cast and the nodules incised; scraping I have found insufficient. After all hæmorrhage has ceased, the tongue has been cleansed with a sponge. I then thoroughly saturate the parts with iodized phenol, applied with a brush. After the lapse of two or three days, I repeat the operation. In some of the cases I have treated on this farm and elsewhere, two dressings have been sufficient to effect a cure, whilst in other instances where the tongue and adjacent structures have become extensively involved before I had been called in to attend, I have found it necessary to make three or four applications.

REMARKS.—The chief points of interest deducible from the above are—

Firstly—The number of animals affected. During the winters of 1885, and 1886, and 1887, and 1888, twelve bullocks suffered from Actinomykosis. I also detected the disease in the tongue of a sheep on the same farm. If the food was the vehicle through which the virus gained access to the mouth, then either the root or ensilage must have been the medium through which it was conveyed, as the supply for both sheep and bullocks was from the same source.

Secondly—The time that elapsed after the second lot of beasts (those bought of the dealer) had been herded with those at the home farm, before a case occurred, was seven weeks. This may furnish us with some guide as to the period of incubation. Possibly an experienced observer would have detected the malady in these animals at least a fortnight before the attendant; and, supposing them to have become affected during the first week after their arrival, the disease then would require about a month to become developed.

Lastly—The uniform success that has attended the treatment adopted. The six bullocks placed under my care recovered, and were ultimately sold fat to the butcher, the other six having been slaughtered through the owner's request, being in good condition. I have tried the use of bichloride of mercury, eucalyptus oil, salicylic acid, and nitrate of silver, but none of these agents have proved so effective as iodized phenol. Applied in sufficient quality it is perfectly innocuous, whether swallowed, absorbed into the system, or inhaled into the air passages. In addition to its specific action when brought into direct contact with the fungus, it is also of great value for its anæsthetic and penetrating qualities.

Gentlemen,—I thank you for your patient attention to these crude and imperfect remarks. I have endeavoured to lay before you some of the

advancements in the veterinary art; but those to which I have referred must be considered simply as illustrations. And although there is much cause for satisfaction, I must not forget to mention, that in the midst of many successes we have instances of comparative failure. The practice of medicine is ultimately the practical application of therapeutic agents, and it is by the careful study of these that some of the greatest victories are to be gained by the coming race. By experiments on the lower animals much has been done in the past; more requires to be done in the future. But here our Government steps in and says, "No, you shall not make such experiments. Let diseases carry off our cattle by thousands, let the human race be decimated by pestilence, let our children die in scores of Scarlet Fever, Diphtheria, and Measles, you shall not, even to save them, touch our cats and dogs." And so for the present this hopeful field of inquiry, to some extent must be abandoned.

Mr. BANHAM opened the discussion by a tribute of praise to Mr. Hammond for his extremely interesting paper. In reference to barley haulm as a feeding material he considered that, though it might be used mixed with other substances for cattle, it was not a desirable provender for horses. In the days of flail-thrashing it might have been less injurious, as then it was bruised and softened. As to the use of the thermometer in practice, he valued it highly, but it was too often supposed to be a direct means of diagnosing disease, whereas its only use was to detect a rise of temperature, and thus show, before any other symptoms were apparent, that disease of some kind existed. The President's remarks on Actinomycosis he looked upon not merely as interesting, but as a valuable contribution to the pathology of the question. Especially would he draw attention to the statement, that about a month was the probable period of incubation. He might also state that the common wens, found on and behind the jaws of cattle, had been found to contain actinomyces, and should be treated as that disease. Concerning vivisection, he would only say that no one objected more than he did to its abuse. He considered no class experiments on living animals should be permitted, and no other experiments until the subject to which they referred had been thoroughly considered, and clear definite ideas formed as to the value of the operation desired and its probable effect. Under such circumstances, experiments on animals were justifiable and necessary; their prohibition simply was an obstacle to scientific progress, and to the general welfare of animals and man.

Mr. OVERED said he felt deeply indebted to the President for his paper, and would like to ask a few questions with a view to further information. As to bleeding as a prophylactic for Parturient Apoplexy, the question arose, how long before calving should the operation be performed? [The President said—"As soon as possible, or even directly after."] His practice was the same, but the difficulty was to guess the exact time. He related a case in which he had advised bleeding, but it was not carried out, and fatal attacks occurred. Afterwards bleeding was adopted, and with perfect success. He had in cases of Flatulent Colic tried puncturing the bowels, but not always with success—perhaps it might be that he had not adopted the practice sufficiently early.

Mr. TURNER, who had practised in Lincolnshire and the fenny districts, in reply to questions from the members, related the procedure adopted to cure wens. The animal was firmly secured, then Sulphuric Acid was poured upon a brick and the wen rubbed with it for ten minutes. A large scab formed which became detached, and the rest of the wen was absorbed. His experience was chiefly applicable to young animals.

Mr. REYNOLDS said he also had had experience of this method of treatment, but as it always resulted in a large blemish, he had given it up, and

now adopted the plan of plugging the wen with one or more plugs of Corrosive Sublimate. This led to the formation and escape of a core, after which the tumour abated, and little blemish resulted.

Mr. WRAGG quite endorsed the President's remarks as to bleeding in the prevention of Parturient Apoplexy. He had seen very good results from it. In his experience, Alderneys were the breed most susceptible to the disease, and he considered some families exhibited distinctly hereditary predisposition to it. He could not sit down without paying a high compliment to the President for his paper, which was not only extremely interesting but most instructive.

Mr. REYNOLDS asked if any gentleman had any experience of intra-tracheal injection for Hoose in calves. He had only twice tried it, and should be glad to hear more extensive experience.

Mr. BARCHAM replied that he had an outbreak extending to sixty-five cases in which he had adopted it, and only one died. He used the injection twice, with an interval of one day. The instrument and the material were both obtained from Messrs. Willows and Francis, and he followed the directions printed upon the bottle. So satisfied was he with the results that he should certainly continue the same treatment.

A vote of thanks was heartily awarded to the President, who modestly replied that he was astonished at the kindness of the members, and really had not valued his paper as much as the meeting seemed to do.

ROYAL AGRICULTURAL SOCIETY.

AT the Council Meeting held on August 1st, Sir John Thorold (chairman of the Veterinary Committee) stated that Professor Brown had presented the following report:—

PLEURO-PNEUMONIA.—The Pleuro-pneumonia Slaughter Order of 1888, which renders it compulsory on the part of Local Authorities to slaughter within ten days all cattle that have been in the same field, shed, or otherwise in contact with cattle affected with Pleuro-pneumonia, has been in operation since March 10th, a period of nineteen weeks up to July 21st, the date of the last return published in the *London Gazette*. It appears from the returns published that since the Order came in force there have been 212 outbreaks of Pleuro-pneumonia reported in Great Britain, 116 of these have been in England, and ninety-six in Scotland. These figures, when compared with the returns for the nineteen weeks prior to the Order coming in force, show an increase of twenty-five in the number of outbreaks in England, and an increase of six in Scotland; but, when compared with the returns for the corresponding period of 1887, they show an increase of only four in England, and a decrease of forty-seven in Scotland. It was not to be expected that in the short time since the Order came in force, it could have produced any material decrease in the number of outbreaks; but it is very satisfactory to note that it does not appear to have prevented the majority of stock-owners reporting the existence of disease, as some people considered it probably would.

With regard to the number of cattle attacked with Pleuro-pneumonia during the nineteen weeks ending July 21st, there have been 421 in England and 340 in Scotland. In reference to the slaughter of healthy cattle which have been exposed to the infection of the disease, there seems to have been, during the past two or three years, a greater inclination on the part of local authorities and owners of stock to slaughter healthy animals which had been in contact with cattle affected with Pleuro-pneumonia. During the ten weeks at the beginning of this year, prior to the passing of the Slaughter Order, there were 1,004 healthy cattle slaughtered on or removed from infected

premises for slaughter either by order of the local authorities or the owners. Since the Order came in force, there have been 3,797 healthy cattle which had been exposed to infection, slaughtered in Great Britain; 1,612 of these have been in England and 2,185 in Scotland.

SWINE FEVER.—During the second quarter of the year there have been 2,021 fresh outbreaks of this disease reported in Great Britain, as compared with 1,025 outbreaks in the first quarter. This is a considerable increase, but still the disease is not so prevalent as it was during the second quarter of last year, when there were 2,708 outbreaks reported. With regard to the number of pigs attacked, there were 10,415 in the thirteen weeks ending June 30th; of these, 5,247 were killed, 3,820 died, and 608 recovered.

ANTHRAX.—It appears from the *Gazette* returns that this disease maintains a very uniform rate of prevalence throughout the year; thus in 1887 the outbreaks reported quarterly were 56, 58, 61, and 61, and in the two first quarters of this year they have been 57 and 54. Of the 54 outbreaks reported during the past quarter, 45 were in England and 9 in Scotland.

Upon the representations of Sir John Astley, the Society's Consulting Botanist had been instructed to proceed to Elsham to report upon four fields of a farm, on which certain cattle and horses that had died suddenly had been grazing. A report from Mr. Carruthers was read to the Committee, stating that in his view the injury to the stock was not due to anything growing in the pasture, because there were no injurious plants growing in the fields. A sample of the water from the farm had been analysed by Dr. Voelcker, who reported that it was, in his opinion, free from pollution.

NATIONAL VETERINARY ASSOCIATION.

(Continued from page 111.*)*

DR. FLEMING, in opening the discussion on Dr. Armstrong's paper, referred to the importance of the study of comparative pathology, and showed that this was recognised by the chief authorities in medicine from the earliest times. To Lancisi, physician to the Pope in the 17th century, was due the honour of being the first to propose stamping out the Cattle Plague when it invaded the Roman States. The greatest physicians had always insisted upon the diseases of animals being studied, in order that those of mankind might be better known. Referring to the establishment of the Royal Veterinary College, and to the great interest taken in it by John Hunter and the principal medical men of that time, Dr. Fleming quoted the opinions of some physicians to show the necessity for those who practise human medicine being acquainted with animal medicine, and, in pointing out that in many continental universities Chairs of Comparative Pathology had been established which were occupied by veterinary teachers, he mentioned what he had done, in conjunction with Sir Henry Acland, to have a Chair founded at the Oxford University. He congratulated the University of Durham on its resolve to confer a benefit on medicine and on the country, by founding a Chair of Comparative Pathology, and thus leading the way to a great reform in medical teaching.

Mr. CLEMENT STEPHENSON, in alluding to the splendid address of Dr. Fleming, went on to discuss some of the topics referred to by Dr. Armstrong, and particularly dwelt on the mistakes made in attributing Scarlatina in man to disease in cattle, and to run directly to the cow, instead of ascertaining whether there were not other sources of infection.

Professor WALLEY said personally he had seen nothing in a cow identical with Scarlet Fever in man.

Professor MACFADYEAN said he had conducted a series of experiments, but had always failed to excite in animals after inoculation a single symptom like Scarlet Fever.

Dr. HEATH, while admitting the importance of bacteriology, thought the study of animal parasites was overlooked, and that those of the dog especially should be attended to, owing to their danger for other animals and mankind.

After remarks from Mr. Cameron, Berwick-on-Tweed, Mr. G. ELPHICK moved, and Professor WALLEY seconded :—

"That in the interest of public health, it is desirable that all large towns should be provided with public abattoirs, and that the slaughter of cattle, sheep, and pigs on private premises should be abolished."

The resolution was carried.

Dr. Armstrong having replied to the criticisms made upon his paper, a vote of thanks to him was proposed by Dr. Fleming, and carried by acclamation.

At the afternoon meeting the paper on inoculation by Mr. A. Robinson, F.R.C.V.S., Greenock, was discussed. The paper itself, of great length but of much interest, dealt with the history and practice of protective inoculation for various contagious diseases, and demonstrated its efficacy, the evidence in favour of the measure for Contagious Pleuro-pneumonia being very strong.

Professor PENBERTHY opened the discussion on the paper. On the ground of the extent of the subject, and the magnitude of the paper, he would ask them to pardon him if he was not so clear as he would like to be. Great energy and perseverance were noticeable in Mr. Robinson's paper. He did not think there was a remark in the paper which might be considered irrelevant, although there were some which might be considered excessive. The importance of inoculation could not be exaggerated, for in inoculation he saw means of lessening disease. From protective inoculation, he thought they had reasonable ground for hoping for good results. In the disease of Anthrax they had positively shown by experimental inoculation that they could ordinarily produce immunity from danger. There was, it seemed to him, some difference of opinion, as regarded the mode in which that immunity from disease was to be brought about. He thought the writer of the paper had used terms too strong as regarded inoculation for Rabies. He (the speaker) did not think they were in a position as yet to arrive at any very positive conclusion, or, at any rate, an inclusive conclusion. Regarding inoculation for Anthrax he must say that, so far as he had been able to carry out experiments on a rather limited scale, they confirmed *in toto* that which Pasteur had said about protective inoculation. There was vaccine to protect against Anthrax which would keep for three months, and which might be used by any ordinary practitioner with perfect safety. He had never inoculated an animal with Pasteur's vaccine where the animal had been at all in danger from the vaccine, or when tested with virulent matter had shown any signs of disease. In inoculation as protective against Pleuro-Pneumonia, they had an extremely difficult matter with which to deal. They had in Pleuro-Pneumonia a disease which experiment, so far as he could gather, had never been able to reproduce in its original character, and this of course rendered proof of protection very difficult. Professor Penberthy next alluded to the evidence which had been arranged by Mr. Robinson from Mr. Bruce, of New South Wales, and Mr. Gordon, of Queensland, neither of whom, he thought, was a veterinary surgeon or a scientific man, and next pointed out that the essayist seemed to have disposed of the evidence of M. Leblanc in a rather peculiar manner. M. Leblanc possessed an enviable reputation as a general practitioner, and yet the remarks made by him derogatory to protective inoculation for Pleuro-Pneumonia seemed to have been treated lightly by Mr. Robinson, who had given too great weight to the generalities of Mr. Gordon and Mr. Bruce. If that which appeared in the

evidence of Mr. Gordon, who was chief Inspector of Stock for Queensland, were true, then Pleuro-Pneumonia in that country was different from what it was in England, so it might be considered they were dealing with a different disease, and therefore Mr. Gordon's evidence on this point was worthless. In conclusion, he referred to the evidence given by the Highland and Agricultural Society's Committee, in which he thought they had the most damaging affirmations by the exponents of inoculation for Pleuro-Pneumonia, but as his time had expired, he could not go into them. He thanked them for their patient hearing.

Mr. CLEMENT STEPHENSON thought it would be better if, instead of going critically into Mr. Robinson's paper, he endeavoured to get a common-sense view of Pleuro-Pneumonia as it affected this country. He questioned very much the value of the information that Mr. Robinson in his travels had obtained. In fact, he thought he could have got more trustworthy information at home. He could not see that the statistics he had given them from the colonies, and from Mr. Rutherford, carried much weight with them. There was nothing in those statistics about cost; and cost, he would beg them to remember, was a very important subject indeed. Inoculation was advocated in the colonies, but he had talked with colonials lately, and they frankly admitted that if they could stamp out Pleuro-Pneumonia they would do so, but they could not. For twenty-five years they had been inoculating, and they still had, and were likely to have the disease. He commenced stamping out in Northumberland in 1878, and the cost reached the twentieth-part of a penny in the pound on the rates. The whole question was one entirely of pounds, shillings, and pence. Some statistics had been given from Holland, but they did not quite correspond with the statistics as given in the Privy Council Department. It was only by stamping out that Holland got rid of the disease. In Denmark, Sweden, and Norway the disease had always been eradicated by stamping out and not by inoculation. In his opinion inoculation for Pleuro-Pneumonia did not stamp out disease: it perpetuated it. Neither had he any hesitation in saying that the only persons who got any good from inoculation were those who performed the operation.

Professor WALLEY agreed with Professor Penberthy in his remarks anent the amount of labour Mr. Robinson had bestowed on his paper. It was true there was matter therein which did not bear much on the subject for discussion, but the introduction of irrelevant matter in a paper like Mr. Robinson's was unavoidable. Mr. Robinson said in his paper that, "animals inoculated with vaccine lymph in no case communicated disease to those animals in contact with them, just as vaccinated persons never infected unvaccinated persons with whom they live." Now, during an outbreak of small-pox in Manchester, certain members of his family got vaccinated, but he was not vaccinated himself, and yet he developed a pock. Proceeding, he thought the temperature of byres had a great deal to do with mortality in connection with inoculation. If people would not keep their byres at a proper temperature heavy losses would ensue, but not otherwise. The most important thing in the whole question was whether or not they were justified in going on with inoculation, or whether they should not adopt a better system of getting rid of the disease. If inoculation were to do any good it should be applied in its proper place, and all cows which had been within a limited area of the disease should be operated upon. During the past thirty years no progress had been made in the direction of getting rid of the disease.

Dr. FLEMING considered the subject of inoculation one of importance, now that they were able to study the nature of the virus. He thought they had every reason to believe that every contagious malady was due to a specific

germ. Over and over again, it had been demonstrated that Anthrax was due to a specific germ. It was not his intention to enter into the merits or demerits of inoculation, but he thought the French Commission had shown in the most conclusive manner that inoculation with the virus of Pleuro-Pneumonia was a protection against that malady, and the members of that commission were neither fools nor knaves. The experiments were absolutely conclusive as to the value of inoculation as protection against Pleuro-Pneumonia. In addition to the evidence of the French Commission they had also the testimony of a large number of the members of their own profession in this country to the same effect. Of course great factors in the protective value of inoculation were the time it should be performed and how it was performed. Most of the failures in the operation, he thought were due, to a great extent, to the neglect of principles which should guide operators in their work. The object of inoculation was to protect from disease. It was all very well to say "resort to slaughter." In a country like Australia, where whole herds of cattle were affected, that was like making a desert and calling it peace. They could not stamp out whole mobs of cattle; therefore, people had recourse to inoculation. In a country like England, where the disease existed only in a limited area, he said stamp it out, and yet stamping out was a reflection on their own scientific ability. If they could prevent animals taking the disease by inoculation, they ought to do so. When protection was difficult, and mistakes were liable to be made, then perhaps the brutal method of stamping out should be resorted to. It struck him that a disease which depended upon a specific virus ought to be stamped out.

Mr. R. RUTHERFORD'S views concerning the question of inoculation were so well known that to go through them, he thought, would be useless. Alluding to the remarks of a previous speaker concerning Mr. Robinson's two Australian correspondents on the question of Pleuro-Pneumonia, he pointed out the responsible positions which those gentlemen filled, and asked if it could be supposed for one moment that they had no veterinary advisers to assist them, or that they had assumed all the authority of writing their valuable reports without the knowledge and sanction of the veterinary advisers of the Government? He ventured to assert that such was not the case. In Australia, through inoculation, they had reduced the terrors of Pleuro-Pneumonia to no terror at all. Now they did not care a snap of the fingers in the colonies for the disease, and, in fact, paid more for herds which had been through places where the disease had prevailed, and more for stations which had been infected than for those which had remained free—so much was inoculation valued in that country. Then, again, in Edinburgh time was when the disease was to be found in most of the byres, but, thanks to inoculation, the dairyman now cared as little about the disease as in Australia. The cost attendant upon inoculation had really been a saving. He did not mean to say that the operation was perfected, but the profession was but doing its duty in endeavouring to perfect it.

Professor MACFADYEAN pointed out that Mr. Rutherford had carefully avoided coming to close quarters with Mr. Stephenson on the question of pounds, shillings, and pence. Personally, he (Professor MacFadyean) would combat as strongly as he had words the statement that it was unscientific to attempt to get rid of Pleuro-Pneumonia by slaughter. He looked upon the method of getting rid of Pleuro-Pneumonia at the least cost as the proper method.

Mr. CUNNINGHAM having given his share of praise to Mr. Robinson for his paper, directed the attention of the meeting to the fact that the most illustrious man of science of the present day was an inoculator and not a stamper out. He thought before Professor Penberthy or Mr. Stephenson passed an opinion on Mr. Rutherford's system of inoculation they should go down and

watch him, and observe how much he had been the means of saving. When they had done this they would be perfectly entitled to pass an opinion thereon. As they had not done so, their opinions must be worth nothing. He knew a district afflicted with Pleuro-Pneumonia where slaughtering failed to get rid of the disease. Mr. Rutherford was called in, and he practically broke the back of the disease, and for the succeeding eight years there were no fresh cases. In the preceding eight years there had been four outbreaks. He had good reason to be an enthusiast in the matter of inoculation, when he had seen the good results therefrom. Mr. Stephenson's assertion that "no one benefited from inoculation but those by whom it was performed," he contested, and claimed that the owners of the cattle had benefited most from it. He maintained that inoculation, if properly practised, was not a delusion and a snare. For the extinction of the disease it was a good measure.

Mr. ROBINSON briefly replied, and stated that he had obtained his evidence with regard to Pleuro-Pneumonia from the best sources, and was not at all displeased with the comments made on his paper.

The PRESIDENT highly praised the paper. Though he had never practised inoculation, he had been observing its operation for some years, and he was altogether in favour of it, although at one time he was opposed to it. Some time ago the byres in Edinburgh were never free from the disease, but now they never had it. It existed in some parts of Scotland, but then it was always imported. He moved a hearty vote of thanks to the essayist.

This was seconded by Professor PENBERTHY, and carried unanimously.

(To be continued.)

BRITISH MEDICAL ASSOCIATION.

AT the annual meeting held this year at Glasgow, in the Public Health section, on the 9th August, the President, Dr. Littlejohn, in introducing a discussion on the

COMMUNICABLE DISEASES COMMON TO MEN AND ANIMALS AND THEIR RELATIONSHIPS,

intimated that Dr. Fleming, Chief Veterinary Surgeon of the Army, was to have opened the discussion, but unfortunately he was detained by illness.

In his absence Principal WALLEY of Edinburgh opened the subject. He said that Anthrax was not at the present moment occupying the minds of sanitarians, but it was most deadly and rapidly communicable from animals to man. Legislation in regard to it was difficult. An outbreak of Rabies was stated to have occurred in Edinburgh in 1881, which was stamped out in three months, and Anthrax might be in like manner stamped out of the whole country in from six to twelve months. The principal malady at present demanding attention was Tuberculosis, one of the greatest pests to man and animals. Principal Walley had no hesitation in saying that it was communicable from animals to man and back again from man to animals in every possible shape, by ingestion, inhalation, and direct inoculation. Out of thirteen animals slaughtered in Edinburgh two or three months ago for Pleuro-pneumonia six were affected with Tuberculosis. Poultry were being slaughtered by this disease in thousands, and, in the speaker's opinion, it might be transmitted by eggs. Much indirect evidence existed of the transmission of Tuberculosis from animals to man by the medium of flesh. There was no power in Scotland, nor, to a large extent, in England, to enable any official to take charge of animals exposed in public markets and affected with Tuberculosis. Principal Walley concluded by moving—"That the Public Health Section of the Association approves of the action of Government in inquiring by commission into the relationship of bovine and human Tuberculosis, and

urges that as soon as possible such measures be taken as the report of the commission might show to be advisable, and that copies of this resolution be forwarded to the Prime Minister, Secretary for Scotland, and the Lord Advocate."

Dr. FARQUHARSON, M.P., said that no doubt existed that various diseases—such as Anthrax—were transmissible from man to animals, but all were slight compared to Tuberculosis. It was now known that the bacillus in a tuberculous animal was the same as that in man, and as the milk of such an animal swarms with the bacilli there seems no reason to doubt that by this medium they were transmitted to the human subject. He (Dr. Farquharson) was afraid that year by year tubercular diseases would become more common in Britain. He had great pleasure in seconding the resolution.

Mr. CROOKSHANK (London) said that Glanders, Anthrax, and other diseases were transmissible to man, but did not arise independently of the lower animals. Tuberculosis, on the other hand, did. It was very common in this country in pigs, cows, poultry, and other animals. The speaker instanced a case in which a rabbit, fed upon milk from a tuberculous cow, died in two months from tubercular disease of the intestines and mesentery. This infective milk was specially liable to produce Tuberculosis in children. Mr. Crookshank also referred to the alleged origin of the human infectious fevers from the cow. As to Diphtheria and Scarlet Fever, he believed that at present we did not know whether or not they were derivable from the cow.

Mr. WILLIAM BROWN, F.R.C.S. (Carlisle), read a paper on the Association of Typhoid Fever with an Infective Fever among Cows. There were cases of Typhoid Fever at a dairy, and in ten weeks twenty cases occurred, and all the affected individuals had derived their milk supply from the infected dairy. The water supply of the dairy was perfect and pure. There was no history of imported infection, and no antecedent case of Typhoid in the immediate neighbourhood could be traced. However, it was ascertained that a febrile disorder, having a striking resemblance to Typhoid, had existed among the cows previously, and the assumption was that the disease from which the cows suffered was Typhoid Fever communicable to man.

Dr. SEATON (St. Thomas's Hospital) believed that milk might be contaminated by human agency.

Dr. EDINGTON (Edinburgh) disbelieved in the theory of Dr. Klein's organism.

Dr. TOMKINS (Leicester) said that there was no direct evidence that tubercular disease could be communicated to man, although he believed it could.

Dr. HIME (Bradford) read a paper on Milk Scarlet Fever, and brought forward instances where Scarlet Fever was in the house of the dairyman, and yet scarcely any cases of Scarlet Fever occurred in their neighbourhood, although some of the dairies supplied as much as seventy gallons of milk daily.

Dr. CARPENTER said that, on authority, there was as much as 80 per cent. of the meat sent into the London market affected with Tuberculosis. He mentioned the case of a school in which Scarlet Fever broke out. The school was shut up, and the curious fact remained that, although the infected children whilst peeling mixed freely with the other children who did not go to this school, yet these said children did not contract Fever.

Dr. MACFADYEAN (Edinburgh) believed that the connection of human and bovine Tuberculosis had been clearly established.

Dr. M'VAIL (Kilmarnock) believed that the infection was due to bovine and not human contraction.

Principal CAIRD showed that the milk of animals affected with Tuberculosis could communicate the disease, and said that he thought that instead of 80 per cent. of infected meat being sold it was more likely but 25 per cent.

Principal MCCALL said he believed that Tuberculosis in the animal was more

dangerous than the same disease in the human subject. He had very seldom found Tuberculosis in slaughtered animals.

Principal WALLEY briefly replied.

In the Pathology section, on August 8th, Professor EDGAR CROOKSHANK made a communication on

TUBERCULAR COWS' MILK.

He reported the examination of milk in the cases of two cows with undoubted tubercular disease. In each case the udder was affected, being indurated and nodular. The milk having been allowed to stand, a small quantity of the deposit was prepared on a cover-glass, and without difficulty abundant tubercular bacilli were found on staining. Tubercular lesions were discovered in the cows on examination after death. Some of the milk, having been mixed with other food, was given to rabbits, and after an interval of some months Diarrhœa set in and death resulted, tubercular ulceration of the bowels and affection of the mesenteric glands being discovered *post mortem*. Dr. Crookshank regards the tubercular bacillus of the cow as identical with that found in man. In view of the fact that milk from tubercular udders must frequently come into the market, he considers that immediate legislation is demanded.

In reply to Dr. Joseph Coats, Dr. CROOKSHANK said that the disease of the udder was not a mere local condition, but part of general Tuberculosis. Its importance, however, consisted in the fact that if the udder was unaffected the bacilli were not found in the milk.

Mr. LOGAN drew attention to the fact that butchers were in the habit of sending meat from cattle which they knew to be tubercular into the market, and that danger might thus arise, especially from the inner surfaces of the ribs having been possibly implicated by extension of pulmonary mischief.

Dr. CROOKSHANK agreed in speaking of such conduct as general, and not prohibited. The virus would, however, be destroyed during the process of cooling. Such a safeguard did not exist in the case of milk, as it is usually consumed unboiled. In reply to Mr. Maylard, he stated further that it was taken for granted that boiling of the milk would destroy its harmful influence, but that this had not yet been definitely proved.

Mr. EDINGTON asked if there were any difference in size between the tubercular bacillus as found in bovine and human Tuberculosis, and if it were possible that one might have been evolved from the other.

Professor CROOKSHANK stated that the opinion that there was such a difference in size, as held by Klein, was probably due to the fact that Klein had examined bovine Tuberculosis only in sections. The bacillus as found in tubercular milk has quite the same size and appearance as that found in tubercular sputum. Inoculation experiments with sputum and milk gave the same lesions (and the same bacilli) in rabbits. Difference of opinion existing as to whether or not the pig is subject to Tuberculosis, Professor Crookshank thought noteworthy a case in which he had an opportunity of making microscopical examination. The animal had had cough, constipation, discolouration of the skin, but no rise of temperature. Lesions were found after death which might to the naked eye have suggested Lymphadenoma, but the microscope proved them by the presence of numerous typical bacilli to be tubercular.

Professor CROOKSHANK next read a paper on

HUMAN AND BOVINE ACTINOMYCOSIS,

which he had studied for a number of years both at home and in Germany. Among the cases which he narrated was that of a heifer with a large growth in the parotid region, measuring eight inches by ten. It was discharging from

several sinuses a quantity of yellowish muco-purulent matter, which on examination was found to contain grains of Actinomycosis. The animal having been killed, the usual appearances in such cases were seen, and the lungs (especially the left) showed nodules at the margins of the lobes and throughout their substance. These had the appearance of tubercular deposits, but were demonstrated microscopically to be actinomycotic. The kidneys, uterus, ovaries, and tongue were healthy. The animal having been said to be "one out of several," investigation was made, and the ailment found to be common in the fen-land, and called "wens," "stickfast," etc. It was said to be treated generally by caustic, and the animals were subsequently sent into the market; eight per cent. were found to be so affected. Several other cases having been detailed, Professor Crookshank summarised his results as follows: Bovine Actinomycosis is common in this country, especially in the fen districts. It occurs as wens or tumours in different parts of the body; it occurs in the lungs, as well as in the mouth and tongue. Unquestionably the disease is found also in man, but there are certain differences. In man there is a mycelium formed and easily demonstrated, whereas the "clubs" are found with difficulty; in animals, on the other hand, the "clubs" are easily demonstrated, but there is a tendency to calcareous degeneration rather than to the formation of the mycelium. The question may thus be raised: Do there exist two distinct organisms, or are these differences due to the difference in soil afforded by the human and the animal body? Questioned by Mr. Edington, Professor Crookshank said that he had made many attempts to cultivate the organism, but had not yet succeeded.

Professor CROOKSHANK then reported a series of investigations upon the occurrence of

ANTHRAX IN SWINE.

He said that, while it was admitted that pigs die after eating the offal from cattle which have died of Anthrax, there has been much difference of opinion as to the cause of the pigs' death, some affirming that it was due to septic poisoning. The bodies of such pigs, on being examined, are found to contain, in the very striking enlargement of the throat which characterises them, a great quantity of gelatinous subcutaneous infiltration. Their tonsils are found to be ulcerated, and, indeed, gangrenous. Such were the appearances in a pig which was caused by the speaker to be fed on offal from Anthrax-affected cattle. Experiments were further made by the injection subcutaneously of equal parts of broth and blood from the spleen of cattle killed by Anthrax. In such cases great infiltration took place in the throat or abdomen, according as the one or the other was chosen as the spot of injection. The animals died, and, on examination, there were found purplish patches on the liver, as well as local boss-like enlargements of the spleen. Similar results were obtained when the injection fluid was taken from guinea-pigs which had been killed by Anthrax; and similar results also when the fluid was prepared from pure agar-agar cultivations, provided sufficient dose was given. From the pigs dying in the last series the organism was again taken, and caused Anthrax in guinea-pigs. Confirmation of these results was obtained from a case in which it was positively known that the spleen of a cow which had had Anthrax was eaten by certain pigs on the same farm. These latter gave the same appearances as in the other cases, especially the enlargements of the spleen. Bacilli were obtained from the organs, cultivated, and found to cause the disease in other animals. Pigs, both old and young, are thus undoubtedly susceptible to Anthrax. In reply to Prof. Roy, it was added that all spontaneous cases hitherto studied had been apparently caused by the ingestion of offal, no other means of inoculation in such cases having been observed.

Prof. MacFadyean asked if there were any explanation of the difference in symptoms between Anthrax as occurring in the pig and as occurring in other animals; also as to any difference in the period of incubation.

As regards the symptoms in the pig, Prof. Crookshank thought that the swelling in the throat, which was invariable in the pig, was probably due to the disease being caused by the ingestion of offal. The tonsils in such cases are found ulcerated or necrotic, and it may be here that the bacillus finds entrance. In the cases where the disease was induced by injection, the gelatinous infiltration and swelling did not take place invariably in the throat, but was determined by the position of the injection. In such cases the track of the needle is gangrenous, and there is great exudation around. The term of incubation varies. In one case death occurred within twenty-four hours; in other cases after an interval of four or five days. Great stress must be laid upon a sufficient dose being administered. Failing in observing this may, perhaps, explain the difference of opinion which has prevailed upon the question of the communicability of Anthrax to swine.

Notes and News.

Vital Tenacity of Ponies.—A correspondent of the *Live Stock Journal*, in alluding to an explosion at St. Helen's Colliery, Cumberland, in April last, mentions that at the time of the accident there were nineteen ponies in the pit, twelve of which were subsequently found dead, having probably been killed, but six were found alive eleven days after the catastrophe, they having had no food during this long time. One was three years old, one five, two seven, one fourteen, and another fifteen. A seventh, aged six years, had somehow or other got loose and away from his companions, and wandered into another part of the workings, and was never expected to be found alive again, but on the 4th May, when the search was being continued for some of the men, thirty-two of whom were killed by the explosion, he was discovered, having fallen down a hole, about six feet, over an archway that had been destroyed at the time of the mishap. He was, of course, naturally weak and exhausted, but, with a little attention, he was soon in his usual good form, and, along with the other horses, he is working in the ordinary way; in fact; the whole of the seven horses are in capital condition, and apparently no worse for their long fasting.

How to Water Horses.—A traveller in Norway says that the horses in that country have a very sensible way of taking their food, which perhaps might be beneficially followed here. They have a bucket of water put down beside their allowance of hay. It is interesting to see with what relish they take a sip of the one and a mouthful of the other alternately, sometimes only moistening their mouths as a rational being would do while eating a dinner of such dry food. A broken-winded horse is scarcely ever seen in Norway. This is not an engineering matter, but horses are machines of much interest as well as value to engineers.

Dishorning of Cattle in the United States.—Unsatisfactory results from "dehorning" are reported in the *Standard*, San Angelo, Texas, as follows: "Dehorning cattle has been found to be far from a wise move. On the Lipan ranch eighty head of steers were dehorned last year, and these cattle are this year in poorer fix than the others, while immediately after the operation they went down very much in flesh. Milch cows dehorned, it was noticed, gave less milk each day. After two or three years, however, there is no appreciable decline in either flesh or production."

EFFECTS OF LIGHTNING.—An American paper says: "Quite a number of horses have been killed by lightning this season. The mare, Oregon Beauty, owned by W. D. Reid, of San Francisco, had been taken east for exhibition purposes, and was in a barn at Coney Island that was struck by lightning and burned. She is reported to have been valued at 15,000 dollars." Another remarks frequent reports come of stock killed by lightning while standing near wire fences. The following is taken from a western paper: "T. J. Parks informs us that his plan of protecting his cattle and fence posts from injury by lightning running along the wire fence, is to attach a piece of wire occasionally to a post, extending above it and running into the ground, thus carrying away the electricity. This is of great importance to stockmen. The loss of cattle and destruction of fence posts has, by the universal use of wire fencing, become a serious matter. A small sum invested in wire will protect both cattle and posts."

HOUNDS AND THE RABIES ORDERS.—The question whether foxhounds are subject to the muzzling orders came before the Cheshire magistrates on August 13th, when Mr. Thomas Hadfield, one of the proprietors of the Runcorn Bone Works, was summoned. Two foxhounds were permitted by him to be at liberty. The defence was that it was impossible to keep these hounds up, otherwise they would all have to be sent back to the kennels. The police, who prosecuted, contended that the hounds were not exempt from the order, and the magistrates, taking the same view, inflicted the nominal fine of sixpence and thirteen shillings costs.

LYONS VETERINARY SCHOOL.—Professor Laulanie has been appointed Director by this School. He has recently had conferred upon him the degree of Doctor by the University of Lyons.

Correspondence.

NEW OPERATIONS IN OUR PROFESSION.

SIR,—I am rejoiced to see that there are distinguished members in our profession who have sufficient courage to step out of the beaten track, and to attempt new methods of treatment with a view of alleviating or removing pain and suffering in animals occupying positions only a degree lower in the scale of creation to ourselves. I say, all honour to these men!

I felt very much interested in an article in last December's VETERINARY JOURNAL, by Mr. F. Smith, on "The Cure of Lameness arising from Side-bones." This is followed by another paper from him on the same subject, for the National Association, and which was discussed at Newcastle. I have carefully read these papers, and listened to the discussion with great pleasure. The principle enunciated is a confirmation of the opinion I placed on record in the *Veterinarian* for 1883, but which opinion was pooh-poohed at the time, and my deductions condemned by members of unquestionable intelligence; but it is a thought full of hope and encouragement when we see how true facts announce themselves. Mr. Smith's explanation of its *modus operandi* is corroborative of the idea I then advanced. I now write in corroboration of his views, as to how side-bones and adjoining sensitive structures can be relieved by removing the tightness and pressure of the wall upon them. Whenever any new method of treatment is promulgated it requires time to establish it, and many opportunities to test its soundness before it is received with confidence. Its usefulness or its superiority over other methods of treatment must be vouched for by many as being a reality, before it is accepted by the profession generally.

Mr. Smith says, "It occurred to me if this (compression) was the case the lameness could be removed, if I relieve the laminæ from pressure and the foot from tension by making such incisions in the horny wall of the foot as would permit it to bulge, or at any rate it would permit the enlarging cartilage to be accommodated without pressure on the delicate and sensitive parts covering it." "To increase the size of the foot for the accommodation of the gradually enlarging cartilage." This result is effected by sawing through the wall in two or more places; but besides this, he completely isolates with his searcher the wall from the sole between the incisions in the wall, and in four weeks in some cases it becomes enlarged, to the extent of two inches. The cartilage is allowed to enlarge consequently on the wall having accommodated itself to the increased size of the cartilage.

Now I have much pleasure in endorsing and supporting Mr. Smith's views on the value and importance of the expansion of the hoof in the treatment of side-bone; and in discussing these matters with a view to the clearing up of one or two points, I feel assured I shall be excused if I differ from him, and show why I differ from him. *In the first place*, I differ from him on the point he has selected for his anterior incision through the wall. It will be attended with danger of wounding the capsule of the joints if made at the anterior point of the lateral cartilage; an inch farther back or forwards, and there would be no danger. Again, he completely isolates the hoof and sole only between the incisions. He admits that they soon fill up and come together, especially towards the inferior part of the wall. *This is solely on account of the isolation being limited.* Did he carry the isolation to the extent of the whole of the quarters and heels under the side-bone or side-bones, his operation would be more abundantly successful.

Again, in the performance of the operation I can see it would be attended with much trouble and difficulty, if not be impossible with a restive horse, to saw the incision inside the foot whilst the foot is held up to the elbow by the assistant. I object to the saw, as an instrument likely to cause a jagged and lacerated incision. I think it would be much better to have the animal cast and properly secured; it would give one a fair chance to perform the operation properly and safely. I should certainly much prefer making the incisions with the searcher down to the sensitive tissues, then take a strong, clean, sharp scalpel, and cut down completely through the periosteum and perichondrium and those dense tissues which cover the bone and connect the sensitive laminæ and pedal-bone; it is, in fact, periosteotomy relieving the ostitis. Mr. Smith says nothing about this, but I think it is important, and much more likely to give complete liberty to the tumefied and ossifying cartilages.

In an article recorded in the *Veterinarian* (for removing the sole) for September, 1883, the following passage occurs: "He (Mr. Greaves) could conceive it might be beneficial for side-bones in this manner. When the sole is removed the bond of connection at the heels and quarters of the wall no longer exists, and when the weight of the horse is thrown on that foot the heels descend, and for want of the bond of connection the *foot spreads out or expands.* At the end of a week or a fortnight it is quite surprising the extent of the expansion; the new horny sole grows stronger and thicker than the one removed, for it has to fill up a wider space by three-quarters of an inch than the old sole. As it grows *it fixes permanently the quarters and the heel of the wall* in the wider shape and size. By this means it naturally relieves the binding tightness of the hoof upon the tumefied and ossified lateral cartilage; in fact, it adapts the wall to the altered condition produced by the side-bones, and gives ease and comfort, just as the pressure of a tight boot, made of strong, thick leather, taken off a corn gives relief."

My contention is that by removing the sole you liberate the whole wall,

and the whole foot expands bodily from the ground surface to the coronet more effectually than by making incisions in the wall simply, making a section of the wall only to bulge, creating a deformity. I know a veterinary surgeon of large and very long experience, who has adopted this method of treatment for the cure of side-bones for a long time with marked success.

Are not the opinions set forth in the above extract the same in principle as those held by Mr. Smith? Are not the theory and effect the same in both—viz., enabling the wall to expand and adapt itself to the altered state of the lateral cartilage? Have we not, unknown to each other, been studying and travelling on converging lines? Is not Mr. Smith's method a confirmation of my idea of how side-bones can be relieved?

When I was an apprentice, more than fifty-four years ago, I have often seen my master cut fissures through the wall, cut them from the coronet to the ground surface, for contraction of the heels of the foot. I have frequently performed the operation myself, not always, but frequently with marked benefit. I do not think incisions through the wall will benefit Laminitis.

The other new operation, for "cure of Roaring," we are anxiously awaiting a further confirmation of. We hope the success will be equal to the sanguine expectations of Dr. Fleming and others. These efforts show that there is life yet in our profession, and that there are men in it whose courage and worth are beyond all praise. THOMAS GREAVES, F.R.C.V.S.

ANSWERS TO CORRESPONDENTS.

F. S. W.—Look in next month's JOURNAL.

CONSTANT READER AND OLD SUBSCRIBER.—Attempts have been made on two or three occasions to get veterinary surgeons exempted from serving on juries, but they were unsuccessful, the last attempt being made in the House of Lords by Lord Aberdare, on the representation and at the solicitation of Dr. Fleming; but, when carried to a division, the motion was lost by a small majority. It is to be feared that it has less chance of being carried in the House of Commons. That members of the profession should have this exemption there can be no doubt, though to what extent the liability acts as a hardship we do not know.

Communications, Books, Journals, etc., Received.

COMMUNICATIONS have been received from R. W. Burke, A.V.D., India; Kay-Lees, A.V.D., Ireland; T. Greaves, Manchester; C. Rutherford, A.V.D., Aldershot; D. D. Lee, Harvard University, U.S.A.; P. Beattie, Bogfern, Turriff; G. Snowball, Ballarat, Australia; H. Kidd, Newbury; J. E. Dibben, A.V.D., Bengal; J. B. Wolstenholme, Manchester; A. E. Macgillivray, Banff; R. S. Barcham, Walsham; "A Constant Reader and Old Subscriber"; S. Bailey, Oldham; A. Leather, Liverpool.

BOOKS AND PAMPHLETS: Progress of the Abattoir System in English Towns; *Dr. Reinold Schmalz*, Die Lage der Eingeweide und die Sektionsteckick bei dem Pferde; Encyklopädie der Gesamten Thierheilkunde und Tierzucht.

JOURNALS, ETC.: *American National Live Stock Journal; Journal of National Agricultural Society of Victoria; Quarterly Journal of Veterinary Science in India; Recueil de Méd. Vétérinaire; Annales de Méd. Vétérinaire; Live Stock Journal; Lancet; Wochenschrift für Thierheilkunde und Viehzucht; Giornale Veterinaria Militare; Hufschmied; Revue Vétérinaire; Repertoire de Police Sanitaire Vétérinaire; American Veterinary Review; London Medical Record; Edinburgh Medical Journal; Clinica Veterinaria; Repertorium der Thierheilkunde; Echo Vétérinaire; Deutsche Zeitschrift für Thiermedicin und Vergleichende Pathologie.*

NEWSPAPERS: *Melbourne Argus; Scotsman; Leeds Mercury; Liverpool Echo; l'Avenir; Baltimore Weekly Sun; Liverpool Echo.*